ACCU-Pro
MODEL 670
SEMI-AUTOMATIC
BEDKNIFE GRINDER

ASSEMBLY
AND
SERVICE
MANUAL

WARNING

You must thoroughly read and understand this manual before assembling or maintaining the equipment, paying particular attention to the Warning & Safety instructions.

6707954 (8-01)

SAFETY INSTRUCTIONS

Safety Awareness Symbols are inserted into this manual to alert you to possible ***Safety Hazards***. Whenever you see these symbols, follow their instructions.

The ***Warning Symbol*** identifies special instructions or procedures which, if not strictly observed, **could result in personal injury.**

The ***Caution Symbol*** identifies special instructions or procedures which, if not correctly followed, **could result in damage to or destruction of equipment.**

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE WRENCHES AND OTHER TOOLS.**
3. **KEEP WORK AREA CLEAN.**
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use Grinder in damp or wet locations, or expose it to rain. Keep work area well lighted.
5. **KEEP ALL VISITORS AWAY.** All visitors should be kept a safe distance from work area.
6. **MAKE WORK AREA CHILD-PROOF** with padlocks or master switches.
7. **DON'T FORCE THE GRINDER.** It will do the job better and safer if used as specified in this manual.
8. **USE THE RIGHT TOOL.** Don't force the Grinder or an attachment to do a job for which it was not designed.
9. **WEAR PROPER APPAREL.** Wear no loose clothing, gloves, neckties, or jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
10. **ALWAYS USE SAFETY GLASSES.**
11. **SECURE YOUR WORK.** Make certain that the bedknife is securely fastened with the electromagnets provided before operating.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in Service Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING.**
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is OFF before plugging in the Grinder.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.
18. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
19. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in Service Manual for the proper location and part numbers of safety decals.
20. **DO NOT OPERATE THE GRINDER WHEN UNDER THE INFLUENCE OF DRUGS, ALCOHOL, OR MEDICATION**

SAFETY INSTRUCTIONS

IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.

Grinding is a safe operation if the few basic rules listed below are followed. These rules are based on material contained in the ANSI B7.1 Safety Code for "Use, Care and Protection of Abrasive Wheels". For your safety, we suggest you benefit from the experience of others and carefully follow these rules.

DO

1. **DO** always **HANDLE AND STORE** wheels in a **CAREFUL** manner.
2. **DO VISUALLY INSPECT** all wheels before mounting for possible damage.
3. **DO CHECK MACHINE SPEED** against the established maximum safe operating speed marked on wheel.
4. **DO CHECK MOUNTING FLANGES** for equal and correct diameter.
5. **DO USE MOUNTING BLOTTERS** when supplied with wheels.
6. **DO** be sure **WORK REST** is properly adjusted.
7. **DO** always **USE A SAFETY GUARD COVERING** at least one-half of the grinding wheel.
8. **DO** allow **NEWLY MOUNTED WHEELS** to run at operating speed, with guard in place, for at least one minute before grinding.
9. **DO** always **WEAR SAFETY GLASSES** or some type of eye protection when grinding.
10. **DO TURN OFF COOLANT** before stopping to avoid creating an out-of-balance condition.

DON'T

1. **DON'T** use a cracked wheel or one that **HAS BEEN DROPPED** or has become damaged.
2. **DON'T FORCE** a wheel onto the machine **OR ALTER** the size of the mounting hole - if wheel won't fit the machine, get one that will.
3. **DON'T** ever **EXCEED MAXIMUM OPERATING SPEED** established for the wheel.
4. **DON'T** use mounting flanges on which the bearing surfaces **ARE NOT CLEAN, FLAT AND FREE OF BURNS.**
5. **DON'T TIGHTEN** the mounting nut **EXCESSIVELY.**
6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code B7.2 for exception).
7. **DON'T** start the machine until the **WHEEL GUARD IS IN PLACE.**
8. **DON'T JAM** work into the wheel.
9. **DON'T STAND DIRECTLY IN FRONT** of a grinding wheel whenever a grinder is started.
10. **DON'T FORCE GRINDING** so that motor slows noticeably or work gets hot.

AVOID INHALATION OF DUST generated by grinding and cutting operations. Exposure to dust may cause respiratory ailments. Use approved NIOSH or MSHA respirators, safety glasses or face shields, and protective clothing. Provide adequate ventilation to eliminate dust, or to maintain dust level below the Threshold Limit Value for nuisance dust as classified by OSHA.

This machine is intended for grinding the bedknife from a reel mowing unit ONLY. Any use other than this may cause personal injury and void the warranty.

This machine is intended for indoor use only.

To assure the quality and safety of your machine and to maintain the warranty, you MUST use original equipment manufactures replacement parts and have any repair work done by a qualified professional.

ALL operators of this equipment must be thoroughly trained BEFORE operating the equipment.

Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder. Do not use a power washer to clean the machine.

Low Voltage Relay

The grinder is equipped with a low voltage relay which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be correct before proceeding further with the grinder.

ADJUSTMENT OF THE LOW VOLTAGE RELAY MAY CAUSE ELECTRICAL COMPONENT FAILURE. ADJUSTMENT OF THE LOW VOLTAGE RELAY WILL VOID ALL ELECTRICAL COMPONENT WARRANTY.

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SPECIFICATIONS

Electrical Requirements ..... 115V 50/60 Hz, 15-amp circuit
Net Weight ..... 780 lbs [354 kg]
Shipping Weight ..... 920 lbs [417 kg]
Maximum Grinding Length ..... 34 in. [863 mm]
Sound Level ..... Less than 75 Dba

SKILL AND TRAINING REQUIRED FOR SERVICING

This Service Manual is designed for technicians who have the necessary mechanical and electrical knowledge and skills to reliably test and repair the ACCU-Pro Bedknife Grinder. For those without that background, service can be arranged through a local distributor.

This Manual presumes that you are already familiar with the normal operation of the Grinder. If not, you should read the Operators Manual, or do the servicing in conjunction with someone who is familiar with its operation.

PERSONS WITHOUT THE NECESSARY KNOWLEDGE AND SKILLS SHOULD NOT REMOVE THE CONTROL BOX COVER OR ATTEMPT ANY INTERNAL TROUBLESHOOTING, ADJUSTMENTS, OR PARTS REPLACEMENT!

If you have questions not answered in this manual, please call your distributor. They will contact the manufacturer if necessary.

TORQUE REQUIREMENTS

Throughout this manual we refer to torque requirements as "firmly tighten" or the like. For more specific torque values, refer to the information below.

Bolts Going into a Nut, or Into a Thread Hole in Steel.
Refer to table at the right.

Bolts Going into a Thread Hole in Aluminum.
Use the Grade 2 values in the table at the right.

Socket-Head Screws
Use the Grade 8 values in the table at the right.

Machine Screw

No. 6 Screws:	11in.-lbs [0.125 kg-m]
No. 8 Screws:	20 in.-lbs [0.23 kg-m]
No. 10 Screws:	32 in.-lbs [0.37kg-m]

	GRADE 2 SMOOTH HEAD	GRADE 5 3 MARKS on HEAD	GRADE 8 6 MARKS on HEAD
1/4 In. thread	6 ft-lbs (0.8 kg-m)	9 ft-lbs (1.25 kg-m)	13 ft-lbs (1.8 kg-m)
5/16 In. thread	11 ft-lbs (1.5 kg-m)	18 ft-lbs (2.5 kg-m)	28 ft-lbs (3.9 kg-m)
3/8 In. thread	19 ft-lbs (2.6 kg-m)	31 ft-lbs (4.3 kg-m)	46 ft-lbs (6.4 kg-m)
7/16 In. thread	30 ft-lbs (4.1 kg-m)	50 ft-lbs (6.9 kg-m)	75 ft-lbs (10.4 kg-m)
1/2 In. thread	45 ft-lbs (6.2 kg-m)	75 ft-lbs (10.4 kg-m)	115 ft-lbs (15.9 kg-m)

ASSEMBLY INSTRUCTIONS

NOTE: For clarity, the Grinder is shown on the following pages without the **optional** carriage bellows installed.

UNPACK THE CARTONS

NOTE: Before you install the machine, read the following assembly procedure completely. Then study "Getting to Know Your Bedknife Grinder" in the Operators Manual.

Use care when unpacking. Double-check the packing cartons for any miscellaneous items before discarding.

Inspect all items for shipping damage as they are removed from the shipping containers. If you find any damage, notify the carrier's claims agent and do not proceed further until the damage has been inspected by the agent. Refer also to the "Shipping and Receiving Instructions" packed with the unit.

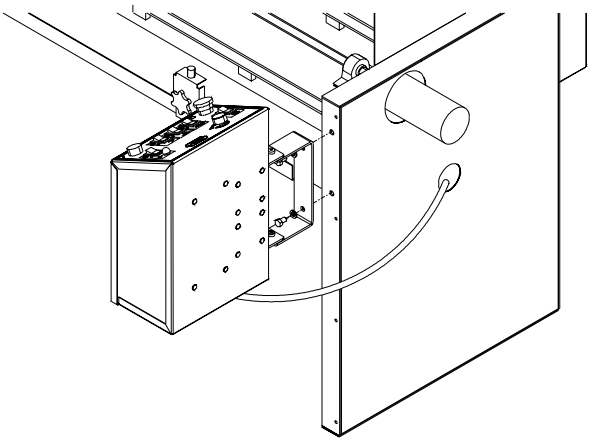


FIG. 1

Remove the Coolant Tank carton from under the machine.

Remove the control box from under the machine. Be careful of the electrical wiring which was preconnected at the factory.

Install the Control Box

Attach the control box to the right front end of the machine, using the two 3/8-16 x 5/8" hex-head bolts, and two lock washers provided. See FIG. 1. The fasteners are shipped in an envelope inside the control box carton.

Remove the Grinder from the Pallet

To remove the Grinder from the wood pallet:

1. Unbolt the brackets that hold each end of the Grinder legs to the bottom of the pallet.

2. The Grinder's four leveling feet (FIG. 2) are seated in countersunk holes in the pallet. Lift one end of the machine until both feet are out of their holes.

3. Prop this first end up with sturdy boards or other supports so the feet remain out of their holes, then lift the other end and remove the Grinder from the pallet.

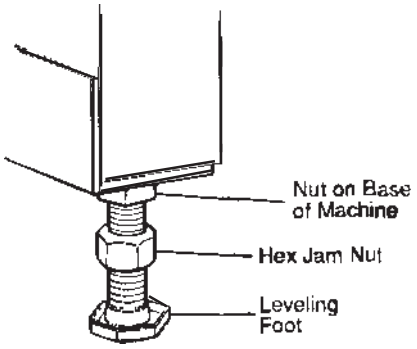


FIG. 2

THE GRINDER WEIGHS 780 LBS [354 KG]. TO LIFT, USE POWER EQUIPMENT OR GET ADEQUATE HELP.

Remove the shipping strap that secures the grinding head and carriage to the left end of the machine during shipment. Reinstall the wiper plate screw which held the right end of the strap. Discard the leg screw and the shipping strap.

ASSEMBLY INSTRUCTIONS (Continued)

LOCATE AND LEVEL THE GRINDER

Set the Grinder on a level concrete floor, on a single uncracked slab of concrete.

If the unit must be located near a wall, allow adequate space for operating and servicing. Refer to FIG. 3 for recommended and alternate locations near a wall.

Place a level on the front carriage rail near the center of the machine and check the level from left to right. See FIG. 4A. Adjust the leveling feet until the machine is level.

Place the level across the front and rear carriage rails near the left end of the machine. See FIG. 4B. Adjust the two leveling feet on the left end until the rear rail (the one closest to the coolant tray) is slightly lower than the front rail--so any coolant on the carriage, main base, or optional bellows will drain back into the coolant tray.

Place the level across the front and rear carriage rails near the right end of the carriage bed. Level the right end in the same way as the left end. For grinding accuracy, the two ends must have the identical backward slant within +/- .01" [.25 mm] so the frame is not twisted.

Recheck the level in both directions. When satisfactory, tighten the hex jam nuts on the leveling feet securely against the nuts welded to the bottom of the base. See FIG. 2. Don't turn the leveling feet when tightening.

Again recheck the level after the nuts are firmly tightened.

FOR GRINDING ACCURACY, THE MACHINE DOES NOT HAVE TO BE PERFECTLY LEVEL. HOWEVER, IT IS CRITICAL THAT FRONT-TO-BACK LEVELING BE IDENTICAL AT BOTH ENDS OF THE MACHINE.

INSTALL THE SPINNING HANDLES

Install the spinning handle on the horizontal handwheels. See FIG. 5. Handle parts are packed in an envelope taped to the wheel.

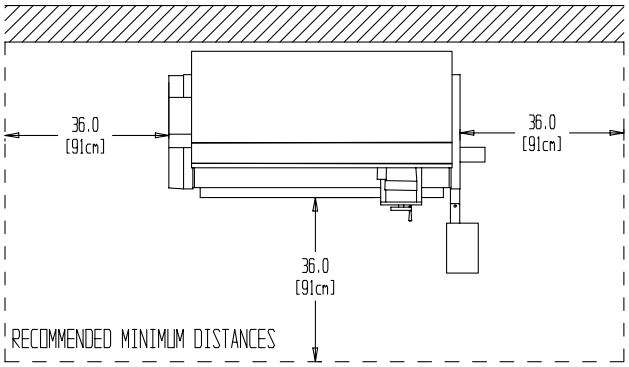
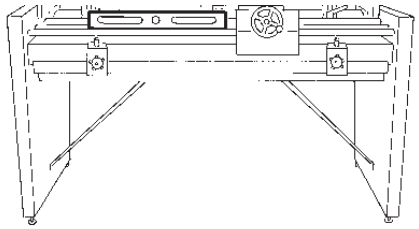


FIG. 3

A Leveling Side-to-Side



B Leveling Front-to-Back

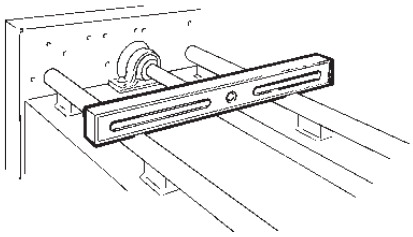


FIG. 4

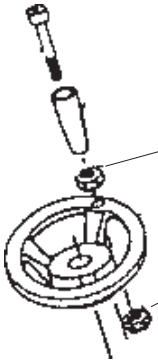


FIG. 5

APPLY POWER

BEFORE YOU APPLY POWER TO THE GRINDER, REFER TO THE "IMPORTANT GROUNDING INSTRUCTIONS" ON PAGE 9.

FIG. 7

115 Volt Model Only. Plug the control box power cord into a standard 115V AC 15-amp grounded receptacle. See FIG. 7.

220 Volt Model Only. For 220 Volt Applications order Part No. 6700951, which includes a 220 to 110 Volt Step Down Transformer. See Details on page 9.

IT IS RECOMMENDED THAT THIS ACCU-PRO BEDKNIFE GRINDER HAS ITS OWN PERMANENT POWER CONNECTION FROM THE POWER DISTRIBUTION PANEL, WITH NO OTHER MAJOR POWER DRAW EQUIPMENT ON THE SAME LINE.

IT IS REQUIRED THAT THE POWER DELIVERED TO THIS GRINDER IS 115 VAC - 15 AMPS. THE TOLERANCE ON THIS POWER REQUIREMENT IS +/- 5%. THEREFORE THE MINIMUM VOLTAGE REQUIREMENT IS 109VAC WITH 15 AMPS. VOLTAGE MUST BE CHECKED WITH ALL EQUIPMENT UNDER LOAD (OPERATING) ON THE CIRCUIT.

DO NOT OPERATE THIS GRINDER WITH AN EXTENSION CORD.

The grinder is equipped with a low voltage relay which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be correct before proceeding further with the grinder.

PROPER GROUNDING OF THE RECEP-TACLE GROUND IN YOUR BUILDING MUST BE VERIFIED. IMPROPER GROUNDING IN YOUR BUILDING MAY CAUSE THE GRINDER TO MALFUNCTION.

ADJUSTMENT OF THE LOW VOLTAGE RELAY MAY CAUSE ELECTRICAL COMPONENT FAILURE. ADJUSTMENT OF THE LOW VOLTAGE RELAY WILL VOID ALL ELECTRICAL COMPONENT WARRANTY.

FOR 15 AMP RATED LARGE MACHINES

For 0 to 30 Feet from panel to receptacle = Use 14 Ga. Wire.
For 30 to 50 Feet from panel to receptacle = Use 12 Ga. Wire.
For 50 to 80 Feet from panel to receptacle = Use 10 Ga. Wire.
For 80 to 140 Feet from panel to receptacle = Use 8 Ga. Wire.

For 0 to 9 Meters from panel to receptacle = Use 2.5mm Wire.
For 9 to 15 Meters from panel to receptacle = Use 4.0mm Wire.
For 15 to 24 Meters from panel to receptacle = Use 6.0mm Wire.
For 24 to 42 Meters from panel to receptacle = Use 10.0mm Wire.

ASSEMBLY INSTRUCTIONS (Continued)

FOR 220 V 50 or 60Hz applications Product No. 6700951 should be ordered.

6700951 includes a 2 KVA 220 Volt Step Down to 110 volt 50/60 Hz transformer which is prewired.

The wiring diagram is shown in FIG. 8.

The power cord has no connector. A connector which is appropriate for your locality and 220 volt, 8 amp application should be installed.

Use only a qualified electrician to complete the installation.

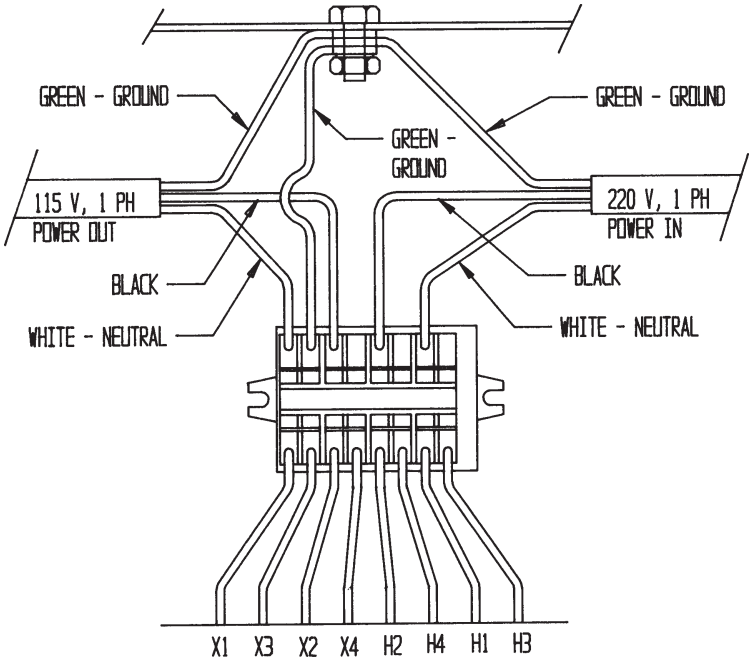


FIG. 8

IMPORTANT GROUNDING INSTRUCTIONS

In case of a malfunction of breakdown, grounding reduces the risk of electrical shock by providing a path of least resistance for electrical current.

This Grinder has an electrical cord with an equipment grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded according to all local or other appropriate electrical codes and ordinances.

Before plugging in the Grinder, make sure it will be connected to a supply circuit protected by a properly-sized circuit breaker or fuse.

Never modify the plug provided with the machine--if it won't fit the outlet, have a proper outlet and circuit installed by a qualified electrician.

ALWAYS PROVIDE A PROPER ELECTRICAL GROUND FOR YOUR MACHINE. AN IMPROPER CONNECTION CAN CAUSE A DANGEROUS ELECTRICAL SHOCK. IF YOU ARE UNSURE OF THE PROPER ELECTRICAL GROUNDING PROCEDURE, CONTACT A QUALIFIED ELECTRICIAN.

INSTALL THE OPTIONAL CARRIAGE BELLOWS (if ordered)

Optional carriage bellows are available to keep excess grindings, dirt, etc. out of the carriage assembly. To install the two bellows:

1. Remove the left and right outside leg panels.
2. Remove the shaft seal on each side of the linear actuator. See FIG. 9. NOTE: When the bellows are used, the shafts don't get lubricated and the seals would run dry. They would then become noisy and not operate properly.
   To remove the seals:
   a. Crank the carriage all the way toward the front (that is, toward the operator's position).
   b. Remove the actuator mounting screw on top of the carriage. See FIG. 9. Then push the carriage toward the right end of the Grinder.
   c. Loosen the two set screws in the bearing pillow block at each end of the drive shaft. Loosen the two set screws in the drive coupling at the right end of the carriage.
   d. Turn the actuator release lever clockwise 1/2 turn until the actuator is released from the shaft. See FIG. 9.
   e. Slide the drive shaft out the left end of the machine.
   f. Remove the shaft seals from the actuator - two screws each.
   g. Reinstall the drive shaft. The right end of the shaft (inside the coupling) should be 1/8 - 1/4" [3 to 6.5 mm] from the end of the motor shaft. Retighten all set screws.
   h. Push the carriage back to the left, and reattach the actuator with the mounting screw. See FIG. 9. Turn the actuator release lever, 1/2 turn.
3. Remove the two rail wiper brackets from each side of the carriage - two screws each. See FIG. 11.
4. Attach the outer end of each bellows to the Grinder leg panel. See FIG. 10. Use six bolts, and hex nuts, at each end. The bolt heads go on the bellows side of the brackets.
5. Attach the inner end of each bellows to the carriage. See FIG. 11. Use four L-brackets, (two on each side of the last bellows fold), six bolts, and two hex nuts at each end. Nuts are required only for the lower holes of the L-brackets.
6. Press the bellows down until it snaps onto the carriage rails.
7. Reattach the left and right outside leg panels.

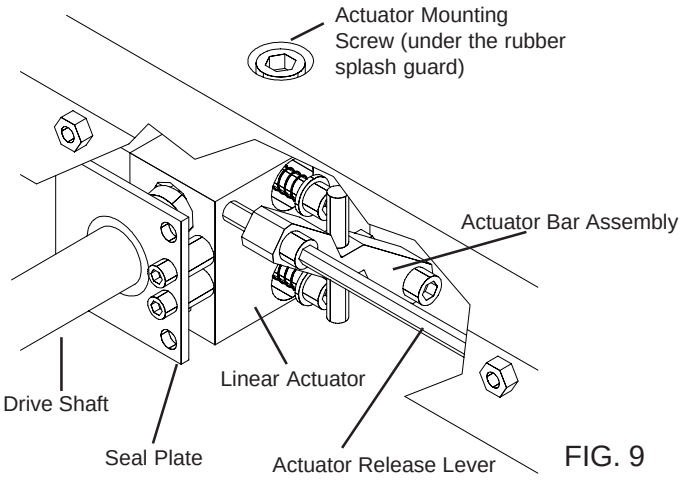


FIG. 9

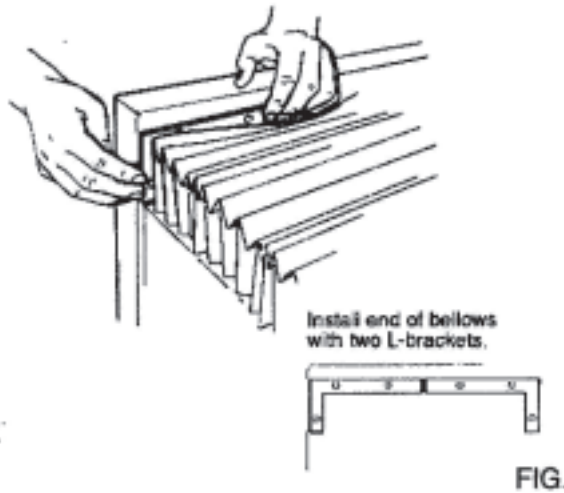


FIG. 10

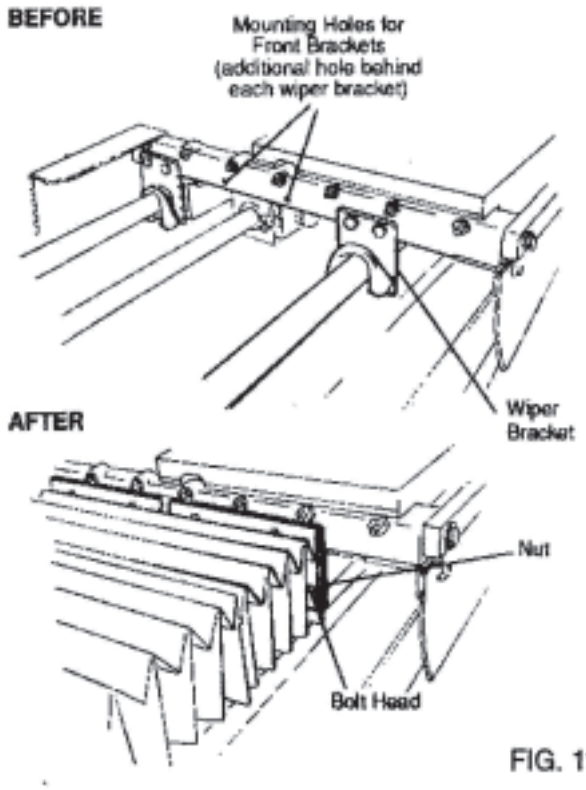


FIG. 11

INSTALL THE COOLANT TANK

Assemble the Coolant Tank as outlined in the instructions (Part No. 7467909) in the coolant tank carton.

Center the Tank under the Grinder.

Install the 1" I.D. drain tubing over the barbed end of the plastic adapter on the coolant tray drain. Cut the tubing to the proper length to reach about 1-1/2" [40 mm] into the large opening on top of the Coolant Tank. See FIG. 12.

A pre-filter sock is shipped with the Tank. Install it onto the tubing, using the plastic tie provided. Drop the other end of the sock into the opening on top of the Tank.

Read the coolant mixing directions and the electrical warnings in the Coolant Tank instructions.

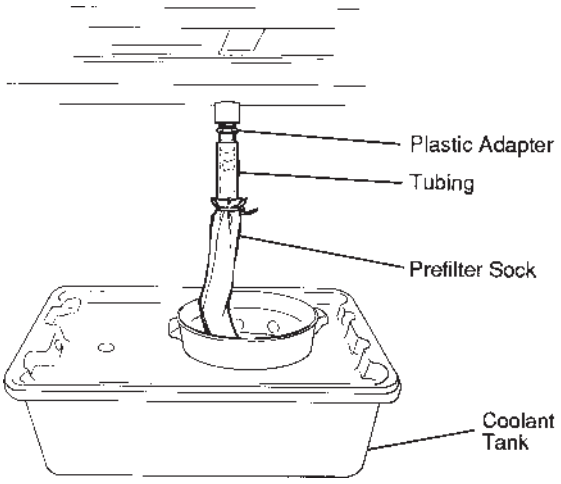


FIG. 12

THE COOLANT RATIO AS SPECIFIED MUST BE USED. TO HIGH A CONCENTRATION OR LOW A CONCENTRATION WILL CAUSE CORROSION AND PERFORMANCE PROBLEMS.

1. Be sure the COOLANT PUMP switch is OFF. Mix (Part No. 3708620) coolant in the coolant tank, at a ratio of 50 parts water to 1 part concentrate. This will take about 6 gallons of water and 1 pint of concentrate (24 liters of water and 0.5 liter of concentrate).

   Refer also to the label on the coolant container, and the instructions packed with the Coolant Tank.

CHECK THE COOLANT PUMP

Plug the pump motor cord (from the top of the Tank) to the female connector from the control box.

RISK OF ELECTRICAL SHOCK! MAKE CERTAIN THAT THE ABOVE ELECTRICAL CONNECTION IS SECURED ABOVE AND AWAY FROM POSSIBLE CONTACT WITH THE COOLANT.

Turn all control panel switches OFF. Close the guard door and press START. Press Coolant Pump Switch to ON. Check that the Coolant System functions properly. Be prepared to press STOP if there is any problem.

NOTE: If the unit doesn't begin to pump coolant, press the reset button on the motor contactor inside the control box. See FIG. 13.

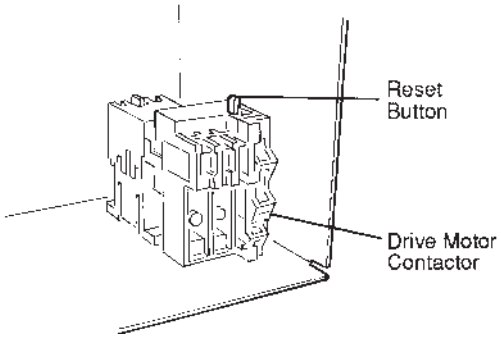


FIG. 13

Secure any excess electrical cord to a crossbar on the underside of the machine.

ASSEMBLY INSTRUCTIONS (Continued)

CHECK THE CARRIAGE TRAVERSE

Move the proximity switch assemblies to about 12" [300 mm] from the ends of the machine, and tighten their knobs.

Visually check that the grinding head will be able to traverse to both sides of the machine without contacting any components.

Turn all control panel switches OFF. Set the TRAVERSE FT/MIN knob to zero. Close the guard door and press START. Press CARRIAGE TRAVERSE to ON. Set TRAVERSE FT/MIN to a low speed, and check that the grinding head runs through a complete traverse cycle. Be prepared to press STOP if there is any interference. Watch carefully for obstructions to the head travel, and check that the grinding motor cord and proximity switch cords are not stretched.

NOTE: If the unit doesn't begin a traverse cycle, press the reset button on the motor contactor inside the control box. See FIG. 13.

CHECK THE GRINDING MOTOR

Turn all control panel switches OFF. Close the guard door to connect the interlock. Press START. Press Grinding Motor Switch to ON. Check that the grinding head runs properly. Be prepared to press STOP if there is any problem.

NOTE: If the grinding head doesn't begin properly, press the reset button on the motor contactor inside the control box. See FIG. 13.

CHARGING TO SUPPLEMENTARY POWER SUPPLY

The Supplementary Power Supply (SPS) comes from the supplier with no charge. When the machine is ready for operation, plug it in and turn on the SPS. The battery will charge in six hours. For SPS functions, refer to the separate manual supplied with the grinder.

MAKE FINAL PREPARATIONS FOR OPERATION

Carefully read the operating instructions in the Operators Manual.

First, study the pages titled "Getting to Know Your Grinder" and "General Operating Information" for important background explanations about the machine and about bedknife grinding. **Then,** read the "Operating Instructions" pages for step-by-step procedures on mounting the bedknife and grinding its top and front faces.

MAINTENANCE

DAILY MAINTENANCE IS SPECIFIED ON PAGE 4 OF THE OPERATOR'S MANUAL, AND IS TO BE PERFORMED BY THE OPERATOR. LISTED BELOW ARE PERIODIC MAINTENANCE ITEMS TO BE PERFORMED BY YOUR COMPANY'S MAINTENANCE DEPARTMENT:

1. Lift the bellows, (See FIG. 14) if used, and wipe off the traverse driveshaft and the bearing rails monthly. When a squeaking noise is coming from the actuator bearings, follow the lubrication procedure for actuator and linear bearings. Generally, this will be every 6 months to a year.

2. Check the gib plate adjustment in the carriage base every 3 months. See Page 21.

3. Replace the four foam rail wipers (FIG. 15) every 6 months of operation. Note: Wipers are removed if optional bellows are installed.

4. Clean the interior and the top cover of the Coolant Tank as necessary and at least every 6 months.

5. Check the brushes on the auto traverse drive motor once every 24 months. Replace as necessary.

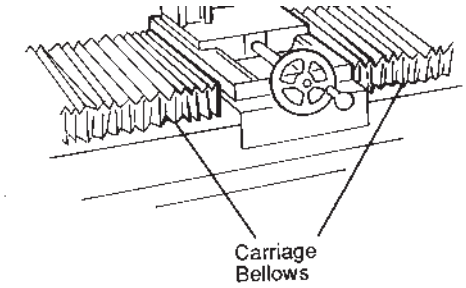


FIG. 14

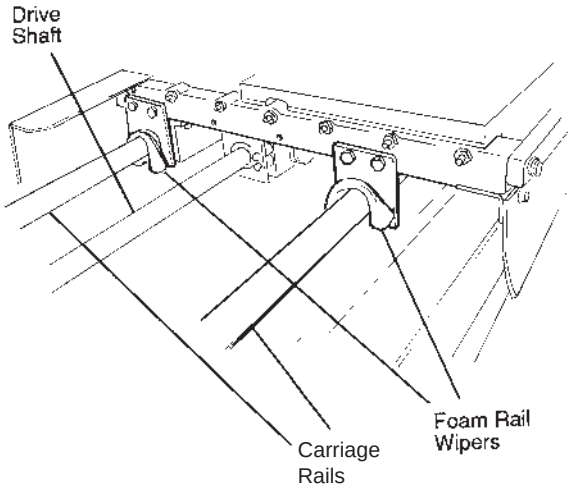


FIG. 15

THE UNINTERUPTABLE POWER SUPPLY (UPS) WHICH IS USED AS A BACKUP TO HOLD THE BEDKNIFE TO THE ELECTROMAGNETS DURING A POWER INTERUPTION HAS A BATTERY. THIS BATTERY HAS A THREE YEAR LIFE AND MUST BE REPLACED AFTER THREE YEARS OF SERVICE LIFE. SEE THE PARTS LIST FOR REPLACEMENT BATTERY PART NUMBER.

LUBRICATION

Actuator and Linear Bearings
Do the following every six months (or more often if the linear actuator seals are squeaking):

1. Thoroughly clean the carriage rails, drive shaft, and shaft seals. Wipe the shafts and seals thoroughly with a clean rag.

   While cleaning, traverse the carriage several times to clean the full length of the drive shaft and rails.

2. Flood-spray all three shafts with WD-40 or an equivalent lubricant (**do not use a Teflon-based lubricant)** until lubricant drips off the shafts. Then run the carriage back and forth through its range of travel, to carry lubricant onto the outer surface of the actuator bearings and the inner surface of the seals.

   NOTE: Because of the flood of lubricant, you may find that the actuator slips and traversing is erratic or stalls. This is not a problem, as it will be corrected in Step 3.

3. With a clean rag, wipe the excess lubricant from the shafts. Run the carriage back and forth through its range of travel, and wipe the shafts after each traverse. Repeat until the shafts feel dry.

IMPORTANT: If the machine will be shut down for more than one month, flood the shafts and other appropriate parts with lubricant as outlined above, and leave the lubricant in place until the unit will be used again. Then repeat the above lubrication procedure before operating.

CLEANING AND MAINTENANCE GUIDELINES FOR POLYCARBONATE WINDOWS

Cleaning Instructions

DO NOT USE GASOLINE
Adherence to regular and proper cleaning procedures is recommended to preserve appearance and performance.

Washing to Minimize Scratching

Wash polycarbonate windows with a mild dish washing liquid detergent and lukewarm water, using a clean soft sponge or a soft cloth. Rinse well with clean water. Dry thoroughly with a moist cellulose sponge to prevent water spots. Do not scrub or use brushes on these windows. Also, do not use butyl cellosolve in direct sunlight.
Fresh paint splashes and grease can be removed easily before drying by rubbing lightly with a good grade of VM&P naphtha or isopropyl alcohol. Afterward, a warm final wash should be made, using a mild dish washing liquid detergent solution and ending with a thorough rinsing with clean water.

Minimizing Hairline Scratches

Scratches and minor abrasions can be minimized by using a mild automobile polish. Three such products that tend to polish and fill scratches are Johnson paste Wax, Novus Plastic Polish #1 and #2, and Mirror Glaze plastic polish (M.G. M10). It is suggested that a test be made on a corner of the polycarbonate window with the product selected following the polish manufacturer's instructions.

Some Important "DON'TS"

- **DO NOT** use abrasive or highly alkaline cleaners on the polycarbonate windows.
- **Never** scrape polycarbonate windows with squeegees, razor blades or other sharp instruments.
- Benzene, gasoline, acetone or carbon tetrachloride should **NEVER** be used on polycarbonate windows.
- **DO NOT** clean polycarbonate windows in hot sun or at elevated temperatures.

Graffiti Removal

- Butyl cellosolve, (for removal of paints, marking pen inks, lipstick, etc.)
- The use of masking tape, adhesive tape or lint removal tools works well for lifting off old weathered paints.
- To remove labels, stickers, etc., the use of kerosene, VM&P naphtha or petroleum spirits is generally effective. When the solvent will not penetrate sticker material, apply heat (hair dryer) to soften the adhesive and promote removal.

GASOLINE SHOULD NOT BE USED!

ADJUSTMENTS

TO REPLACE THE LINEAR ACTUATOR BEARINGS

NOTE: Do not remove the linear actuator from the drive shaft. Only remove the bearings from the actuator block.

1. Crank the horizontal handwheel until the carriage is all the way forward (toward the operator position).
2. Turn the actuator release lever 1/2 turn clockwise to release the linear actuator bearings from the drive shaft. Slide the actuator release lever out of actuator bar assembly by loosening the retainer shaft collar, which preloads the holding spring. See FIG. 18A and 18B.
3. Remove the feed screw guide two mounting screws and slide the grinding head assembly back. Lift the rubber splash guard to expose the actuator mounting screw (FIG. 17) on the top side of the carriage base. Remove the mounting screw, to disconnect the linear actuator from the carriage. Slide the carriage assembly to one side.
4. Disconnect the shaft seal plate (FIG. 17) from each side of the linear actuator. Slide the seals down the drive shaft until they are out of the way. (If the optional carriage bellows were installed, the shaft seals may already have been removed).
5. Remove the shoulder bolts holding the six bearings (three on each side) to the actuator block. Remove the old bearings and discard them, but save the inside washers and shoulder bolts.

   Inspect the hole from which the bearing and shoulder bolt were removed, for foreign matter. Clean thoroughly.
6. Wipe the drive shaft clean and dry.

If oil is left on the drive shaft, the pulling force may have to be set too high in the following procedure. This will shorten the bearing life.

7. Insert the shoulder bolts through the new bearings and through the inside washers (saved in Step 6). Then install the complete bearing assemblies into the actuator block and tighten the shoulder bolts.

Be very careful not to cross-thread the bearing bolts!

Reinstall the shaft seal plates if applicable. Be sure the seal plates are mounted concentric to the drive shaft.

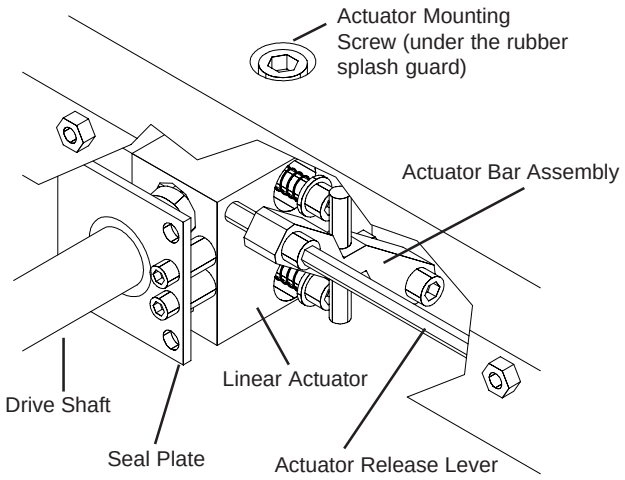


FIG. 17

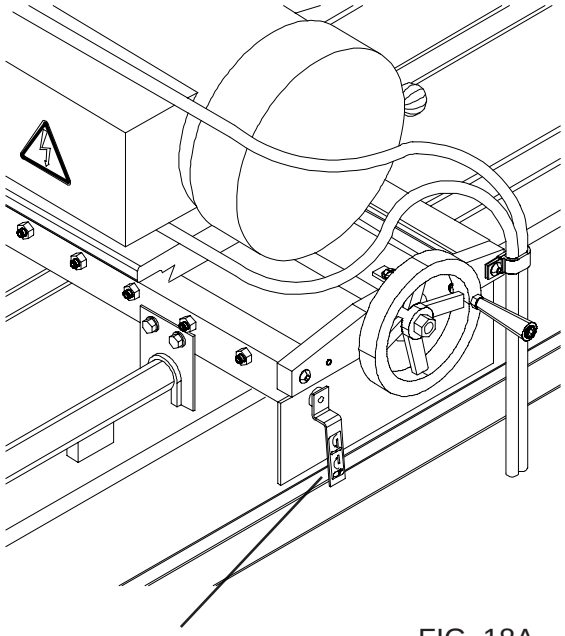


FIG. 18A

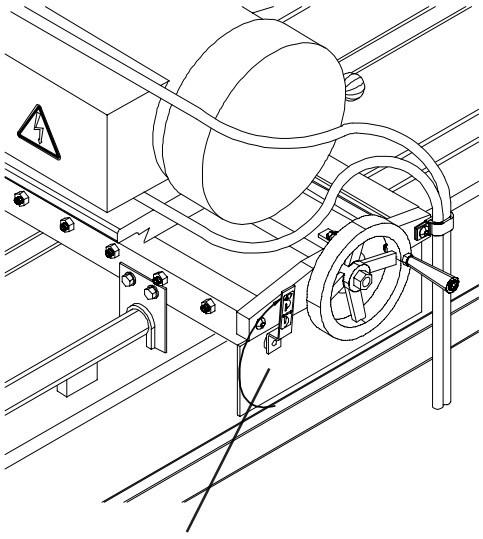


FIG. 18B

TO REPLACE THE LINEAR ACTUATOR BEARINGS

8. Slide the carriage over the actuator, and line up the hole in the carriage with the tapped hole in the top of the actuator block. Insert the actuator mounting screw through the self-adjusting bearing, and tighten the screw.

9. Install the two feed screw guide mounting screws. Install the actuator release lever into the actuator bar assembly. Turn the actuator release lever counterclockwise 1/2 turn to engage the actuator.

10. Connect a spring scale so it pulls on the carriage parallel to the drive shaft. Hold the drive shaft from rotating while you pull on the carriage. See FIG. 19.

    To overcome the actuator, the pulling force should be 45 to 60 lbs (20-27 kg), with 50 lbs (23 kg) being ideal. If not within those specifications, the actuator tension must be adjusted. See "Adjusting the Pulling Force" below.

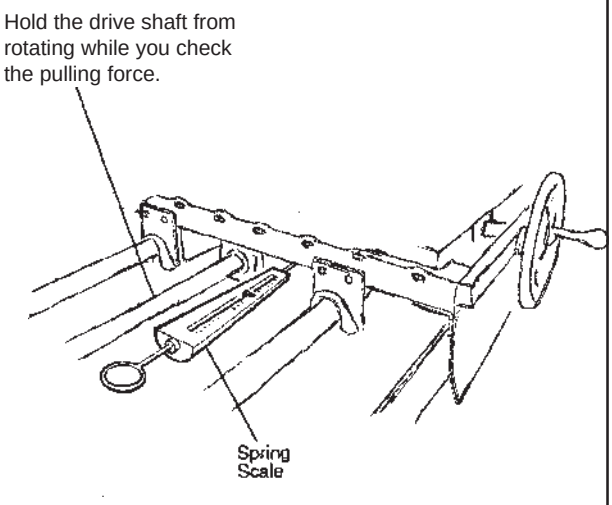


FIG. 19

Exceeding 60 lbs force won't greatly improve drive performance - and it will shorten the bearing life.

Adjusting the Pulling Force

If the pulling force is not within specification (Step 10 above), adjust it:

1. With the actuator bearings engaged to the drive shaft, readjust the two outboard screws with springs that hold the actuator together. To reach these screws, you must remove the actuator bar assembly. See FIG. 17. Turn each outboard screw an equal amount when resetting. Turn clockwise for more tension.
2. Check the force again (repeat Step 10 above). Continue adjusting and rechecking until within specification.

   NOTE: The factory-adjusted position to reach tension specifications is to compress the spring until there is .22 in. (5.5 mm) clearance between the underside of the washer and the actuator block. See FIG. 20. Use this as a starting point unless you are already close to the specified tension.
3. When the tension adjustment is correct, reinstall the actuator bar assembly and actuator release lever.

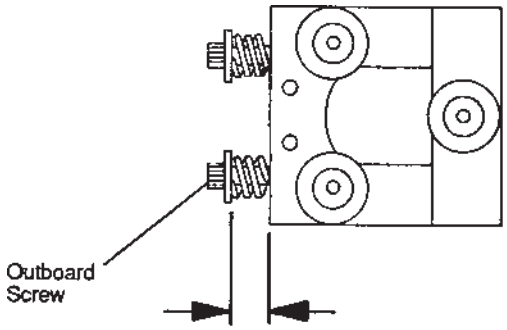


FIG. 20

If the actuator release lever is tightened too much, it will contact the outboard screw heads and override their adjustment, which could cause a traverse malfunction. Make certain that you have full engagement when you reengage the actuator.

TO REPLACE THE CARRIAGE LINEAR BEARINGS

NOTE: Set a small bench or table near the center front of the machine for use in the following procedure.

1. Remove the **optional** carriage bellows (if used) from the carriage. Remove the actuator release lever from the linear actuator.
2. Remove the complete carriage assembly from the machine:
   A. Remove the two feed screw guide mounting screws and pull the grinding head assembly back. Lift the rubber flap and expose the actuator mounting screw (FIG. 22) on the top side of the carriage base. Remove the screw, to disconnect the actuator from the carriage.
   B. Remove the bolts which secure the front and rear carriage rails to the Grinder base (six screws for each rail, accessible from beneath the machine).

The carriage assembly weighs about 50 lbs (23 kg). If necessary, get help for the following steps.

   C. Lift the complete assembly (carriage, carriage shafts, and grinding head) out onto the table in front of the Grinder. Be careful you don't damage the motor cord.
3. Lift the carriage and slide the rails out of the bearings, one at a time.
4. Remove the three linear bearing pillow blocks (four screws each) from the bottom of the carriage, and discard them.
5. One at a time, slide the three new linear bearing pillow blocks onto a carriage rail.
6. Adjust the tension screw (FIG. 23) on the side of each bearing block so that when you radially rotate the pil low block around the carriage (See FIG. 24) rail there is no free play between the bearing and rail. You should feel a strong drag.

Repeat this adjustment to all three pillow blocks, and then remove the pillow blocks from the carriage rail.

NOTE: The tension is too tight if you feel a cogging action when you rotate a pillow block around the rail. This cogging is caused by the bearing skidding on the rail. Rocking the bearing block back and forth should be a smooth uniform motion.

Bearings which are too tight or too loose will cause poor grinding quality. Bearings which are too tight will also have a much shorter life, and could damage the rail.

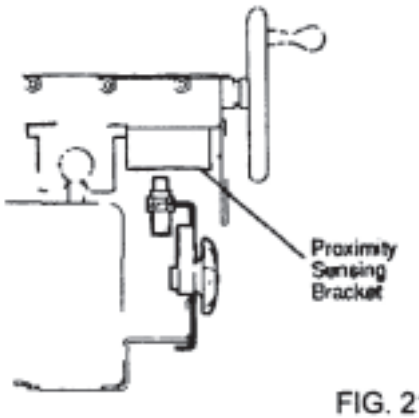


FIG. 21

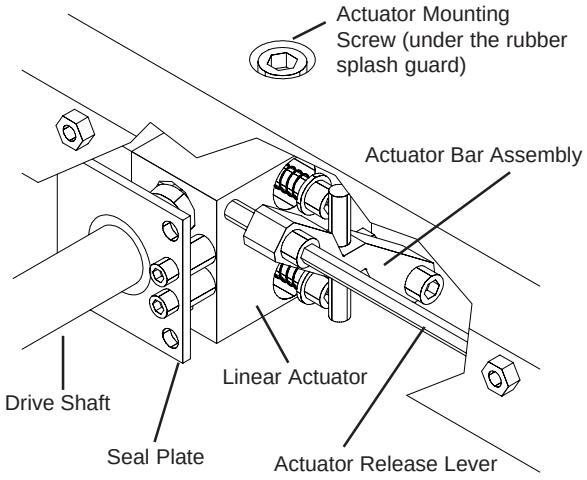


FIG. 22

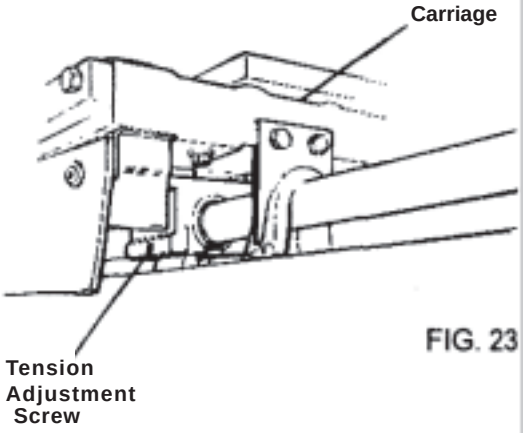


FIG. 23

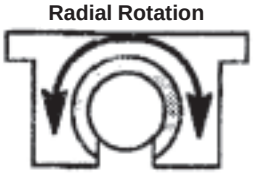


FIG. 24

TO REPLACE THE CARRIAGE LINEAR BEARINGS

7. Attach the three linear bearing pillow blocks loosely to the bottom of the carriage, with their tension adjustment screws (FIG. 23) facing outward.
8. Clean the carriage rails.
   NOTE: The two rails are interchangeable and are also reversible (end-for-end).
9. Insert a rail through the rear two pillow blocks, and align the rear pillow blocks to each other with a straight edge laid along their sides. See FIG. 25. When aligned, tighten the four socket-head screws which hold each rear pillow block. Slide the other carriage shaft through the front bearing, but do not tighten the socket head screws.
10. Lift the complete carriage assembly back onto the Grinder main base, and secure the rear carriage rail to its V-groove bosses with the six bolts.
11. With the front rail resting in the V-groove bosses and the carriage approximately centered on the machine, tighten the two outside socket-head screws which secure the front pillow block. Lift the front of the carriage, and tighten the two inside pillow-block screws. Secure the front carriage rail to its V-groove bosses with the six bolts.
12. Recheck the bearing tension. The tension is correct when you try to lift the carriage and can feel no free carriage movement up or down.
    Check for excessive carriage-traverse load by using a spring scale to pull on the carriage parallel to the drive shaft (as in FIG. 19). There should be only about a 3- to 5- lb. pulling force.
    To double-check, manually slide the carriage assembly from one end of its travel to the other. There should be uniform resistance through the full range of travel.
13. Slide the linear actuator under the carriage, and line up the hole in the carriage with the tapped hole in the top of the actuator block. Insert the actuator mounting screw through the self-aligning bearing, and tighten it.
    Be careful not to cross-thread the screw.
14. Reinstall the feed screw guide mounting screws and then the actuator release lever into the linear actuator.
15. If being used, reattach the two carriage bellows. Refer to the assembly section of this manual.

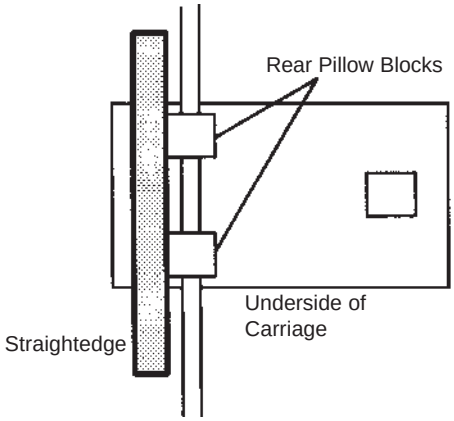


FIG. 25

TO ALIGN THE MOTOR SHAFT AND DRIVE SHAF

There must be 0.12 to 0.50 in. (3.0 to 12.7 mm) en clearance between the traverse motor output shaft an the drive shaft, inside the flexible coupling (FIG.27). To prevent drive shaft "whipping" at higher travers speeds, the two shafts must be aligned so they ar concentric within .010 in. [0.25 mm]. To align:

1. Loosen the two set screw in the coupling.
2. Remove the cover on the outside of the right leg.
3. Loosen the two bolts which secure the motor assembly to the leg.
4. Visually align the two shafts, then tighten the motor mounting bolts. Reinstall the leg cover.
5. Check that the spiral gaps in the flexible coupling are equally spaced, with no compressio or extension load on the coupling, then tighten th coupling screws.
6. Check that the bearing load block is at 90° to the drive shaft (within +/- 1/4 degree). Use a precision square held against the bearing shoulder and the rear rail, as in FIG. 26.

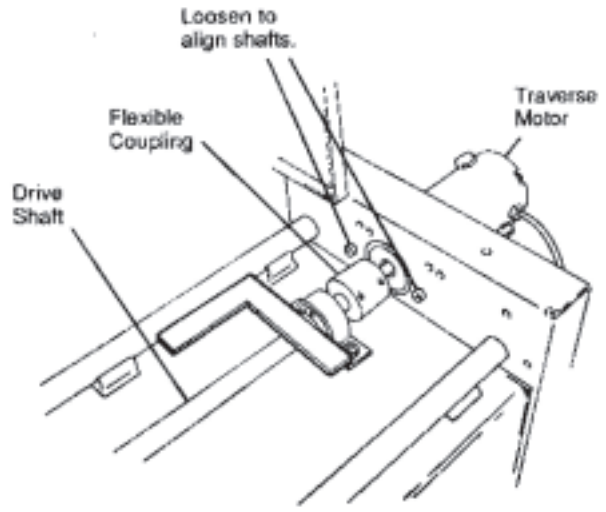


FIG. 26

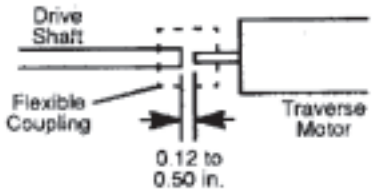


FIG. 27

TO ALIGN THE REAR RAIL AND DRIVE SHAFT

The rear carriage rail and the drive shaft must be precisely aligned:

1. Loosen the two bolts holding the bearing suppor blocks at each end of the drive shaft. FIG. 28.
2. Align the drive shaft and rear carriage rail (FIG. 29) so the distance between their facing surface is 3.375"+/- .010 [85.75 mm +/- 0.25]. See FIG. 29.Then tighten the support block bolts.
3. Check that the bearing support blocks are still at 90° to the drive shaft (within +/- 1/4 degree). Use a precision square held against the bearing shoulder and the rear rail.
4. If you have difficulty obtaining the above alignmen check the straightness of the carriage rails (see below).

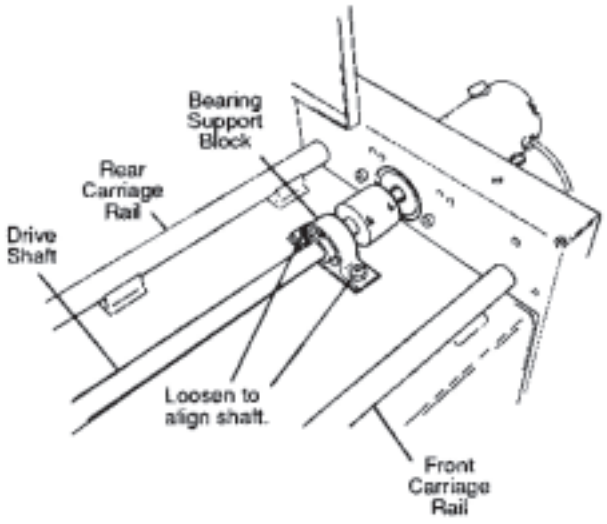


FIG. 28

NOTE: The vertical and horizontal straightness of th rails is very accurately set at the factory, so they ar unlikely to be incorrect. Contact the factory if you sus pect a problem after making the following tests.

FIG. 29

If the drive shaft is adjusted, you may have to realign the motor shaf and drive shaft (see above).

TO ADJUST THE PROXIMITY SWITCHES

For the proximity switches to work properly and reverse the direction of the carriage at each end of a traverse, a distance of 3/16 in. +/- 1/32 [4.75 mm +/ - 0.75] must be maintained between the top of the switch and the actuator bracket on the bottom of the carriage. See FIG. 33.

To adjust the clearance, loosen one of the switch mounting nuts while tightening the other.

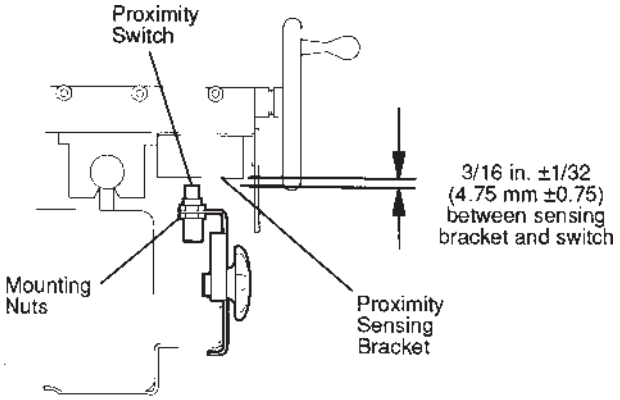


FIG. 33

TO ADJUST THE GIB PLATE

The gib plate must be readjusted occasionally to eliminate free play. Otherwise the grinding head can move from side to side, and the bedknife may be ground unevenly.

The gib must allow the carriage to be cranked freely forward and back without any side play.
See FIG. 34. To adjust:

1. Crank the carriage all the way forward (toward the operator position).
2. Tighten the front gib screw until the carriage has no side play but the horizontal handwheel can still be cranked.
3. Crank the carrige gradually back (away from the operator position), and adjust the remaining gib screws as you go.

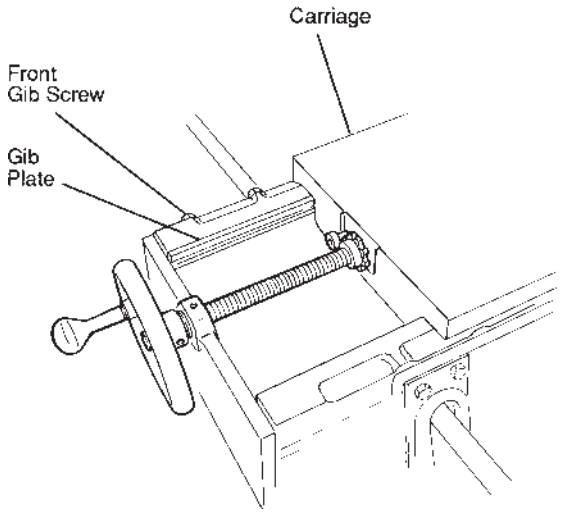


FIG. 34

TO ELIMINATE CARRIAGE INFEED BACKLASH

If there is backlash in the carriage infeed handwheel (FIG. 35), there are two adjusting points to check:

1. Conical washers behind the shaft adjusting nut:
   A. Unscrew the shoulder bolt.
   B. Hold the horizontal handwheel, and turn the shaft adjusting nut counterclockwise until the conical washers are touching each other. Continue turning the nut counterclockwise until the next notch is centered over the shouder-bolt hole. Then turn the nut one notch (40°) further.
   C. Reinstall the shoulder bolt to lock the nut in position.

2. Washers behind the handwheel:
   A. Remove the setscrew holding the calibration ring to the handwheel.Go through the set screw hole and loosen the setscrew holding the handwheel to the shaft (about one-half turn).
   B. Tighten the hex nut which secures the hand wheel to 100 in.-lbs [1.15 kg-m], then back it off 1/2 turn.
   C. Check for .015 in. [0.4 mm] gap between the wave washer and flat washer. See the insert to FIG. 35. Readjust the hex nut if necessary.
   D. Tighten the set screw holding the handwheel to the shaft. Reinstall and tighten the calibration ring setscrew.

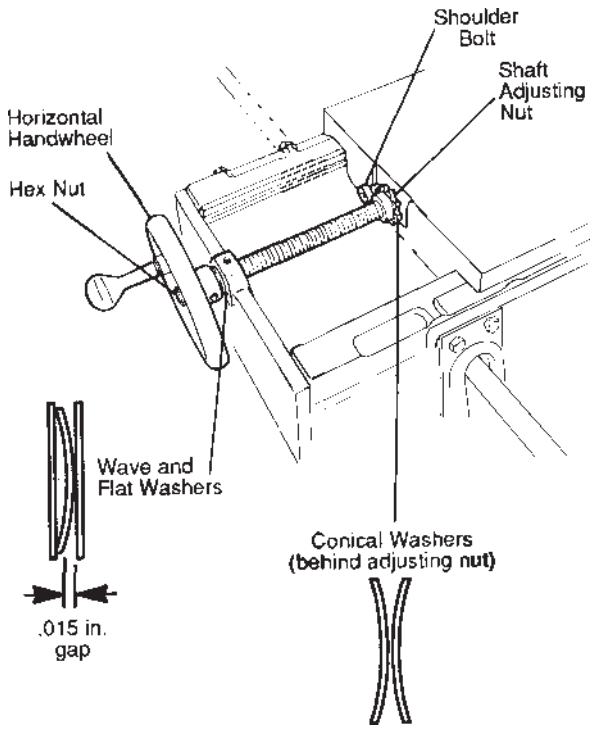


FIG. 35

ADJUSTMENTS (Continued)

POTENTIOMETER ADJUSTMENTS TRAVERSE DRIVE CONTROL (TDC)

Min. Speed--Factory set at full (CCW) 8:30. Do not change this setting.

(Right Traverse) Forward Torque--Factory set at full (CW) 4:30. Do not change this setting.

(Left Traverse) Reverse Torque--Factory set at full (CW) 4:30. Do not change this setting.

IR COMP--Factory set to 9:00. Regulation of a traverse motor may be improved by slight adjustment of the IR COMP trim pot clockwise from its factory-set position. Overcompensation causes the motor to oscillate or to increase speed when fully loaded. If you reach such a point, turn the IR COMP trim pot counterclockwise until the symptoms disappear.

Max. Speed--Set at 3:30 for maximum voltage of 90 Volts DC to the traverse motor. When voltage is above 90 volts DC, the traverse motor will start to pulsate and not run smoothly.

(Right Traverse) Forward Acceleration--Factory set at full (CCW) 8:30. Do not change this setting.

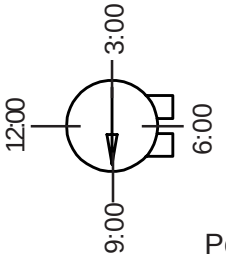
(Left Traverse) Reverse Acceleration--Factory set at full (CCW) 8:30. Do not change this setting.

(DB) Dead Band is the potentiometer setting for the 50 or 60 Hz cycle control. Factory set to 9:00, works for both 50 and 60 Hz. Do not change this setting.

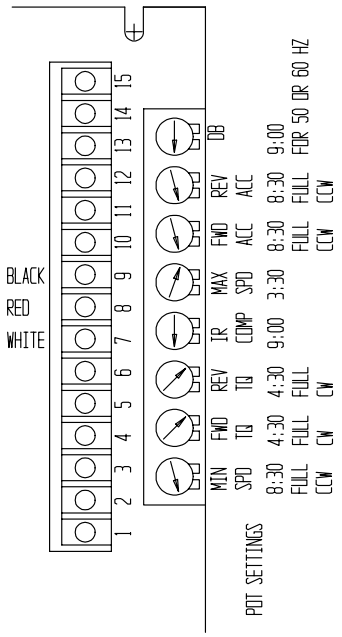
Calibrating the **DWELL TIME** rotary DIP switch adjusts the amount of time the process remains in the stop position after a limit switch is actuated. The **DWELL TIME** range is adjustable from 0 - 4 seconds. A DIP switch setting of 0 sets the **DWELL TIME** to 0 seconds, while a setting of 9 sets the **DWELL TIME** to 4 seconds. Dwell time is preset to #2 setting for a 1 second dwell time when reversing at each end of stroke. A setting of 4, sets the dwell time at 2 seconds, etc.

Diagnostic LED's indicate the function that is currently being performed:

- **POWER indicates that ac power is being applied to the control.**
- **FORWARD indicates that the process is running in the forward direction (traversing left).**
- **REVERSE indicates that the process is running in the reverse direction (traversing right).**
- **PROX 1 FWD LIMIT lights when the forward limit switch is actuated (left prox).**
- **PROX 2 REV LIMIT lights when the reverse limit switch is actuated (right prox).**
- **DWELL lights when the process remains stopped after a proximity switch is actuated.**



Potentiometer
Clock Orientation


BLACK
RED
WHITE
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
MIN SPD 8:30 FULL CCW
FWD TQ 4:30 FULL CW
REV TQ 4:30 FULL CW
IR COMP 9:00
MAX SPD 3:30
FWD ACC 8:30 FULL CCW
REV ACC 8:30 FULL CCW
DB 9:00 FOR 50 OR 60 HZ
POT SETTINGS

--ELECTRICAL--

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Grinding motor do not function (no apparent power to machine).	**A--**Grinding Motor Switch (GMS) is not on.	Turn switch on.	
	B--Main power source breaker is tripped, power source switch is off, or grinder is not plugged in.	Reset breaker, turn switch on and plug machine in.	
	C--System Start Switch (SSS) is not on.	Press System Start Switch.	
	D--Guard door is not closed	Close the guard door.	Because the guard door is interlocked to the grinding motor, the grinding motor will not operate if door is open.
	E--Insufficient Line Voltage to power the low voltage relay.	Check status of the low voltage relay inside the control box.	If "norm" light is lit, relay is satisfied and line voltage is acceptable. If "trip" light is lit, line voltage to the grinder is inadequate and must be corrected.
	F--Voltage not going to magnetic starter.	With the volt meter set on AC voltage, check L1 (black) to L2 (white) for lines coming in of 115 volt. Check power source fuse.	AC voltage power source required.
	Solenoid in magnetic starter does not pull in.	Check for loose connections on magnetic starter. Check for 115 Volts AC across starter coil A1 to A2. NOTE: Contactor clicks when engaging.	These wires control magnetic starter voltage for main power.
	Solenoid pulls in, but no voltage out of magnetic starter.	Check for 120 volt AC between terminals T1 (black) and T3 (white). T1 and T3 are main power out lines. NOTE: T2 is jumpered to L3. Check reset overload on starter by pushing down on blue button. Check terminal connections between contactor and overload relay. If no voltage on output, replace magnetic starter.	Overload may have been tripped when moving machine or machine grinding head motor overload or electrical power surge.
	G--Voltage is not going through interlock relay.	Check for 115 VAC at incoming side of relay. Terminals 4 & 8. Check for 115 VAC at output side of relay terminals 2 & 6. Checks must be done with guard door close, Relay Coil engaged.	

--ELECTRICAL--

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Insufficient hesitation at carriage stops prior to reversing traverse direction for relief grinding.	The dwell time on the traverse drive control not set properly.	Reset dwell time on traverse control board as required; one increment increases dwell time by 1/2 second. See Page 50.	
If the carriage traverses to one end of stroke or the other and it stops and does not reverse direction .	Proximity switch is not working properly or wire connections are loose.	First check to see if proximity light comes on when placing a steel piece over the prox switch. When the light is on it means that there is electricity coming to proximity switch. Left proximity (PROX 1) check Traverse Drive Control (TDC) between terminals #14 (black wire) and #15 (brown wire) Right proximity (PROX 2) check (TDC) between terminals #13 (black wire) and #15 (brown wire). Replace proximity switch if the voltages do not read as above.	The light coming on shows the proximity is getting electrical contact. Proximity light on-- 0 Volts DC Proximity light off-- 12 Volts DC Proximity light on-- 0 Volts DC Proximity light off-- 12 Volts DC
If the carriage traverses past the proximity switch and keeps on traversing in same direction.	The two proximity switches have been reversed on the slide bar.	Reverse the switch assembly on the slide bar	This will only happen if the main reversing board has been replaced and not rewired to electrical diagram.
	Proximity switch has failed	Make sure the proximity light is coming on when placing a steel piece over the prox switch. Check proximity spacing to the sensor. If no light, first check adjustment section for proximity setting. If there is a light, it means that there is electricity coming to the proximity switch. Left proximity (PROX 1) check (TDC) between terminals #14 (black wire) and #15 (brown wire). Right proximity (PROX 2) check (TDC) between terminals #13 (black wire) and #15 (brown wire). Replace proximity switch if the voltages do not read as above.	Proximity light on--0 Volts DC Proximity light off-- 12 Volts DC Proximity light on--0 Volts DC Proximity light off-- 12 Volts DC A loose wire connection will give intermittent electrical contact.
Traverse changes directions erratically while running in traverse cycle.	Loose wire to proximity switch.	Check wire connections from the proximity switches and tighten down screws.	

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Traverse motor does not work.	**A--**Traverse Motor Switch is not on.	Turn on motor switch.	
	B--Blown fuse.	Replace the 2 amp slo-blo fuse on the control board and decrease stock removal rate.	Extremely heavy grinding cuts cause excessive loading of the motor.
		Replace actuator bearings if they are worn and do not rotate freely. (For more detail, see actuator maintenance in the adjustment section of the manual.)	Worn and binding actuators causes heavy loading to motor.
		Replace the lineal bearings in the main carriage. Carriage should traverse freely with a 3 lb. maximum loading. Also check for excessive bearing preload. (For more detail see carriage bearing replacement in the adjustment section of the manual.)	Grinding grit over a period of time does get into the lineal bearings and causes excessive drive torque of carriage.
	C--No voltage going to motor.	Check for 90 volt DC at the circuit board leads going to the motor. Across terminals A1 and A2, check reading with a voltage meter. When there is voltage from the circuit board but DC motor does not run, check wiring and connections. The voltage reading varies with speed pot setting. NOTE: Make sure speed pot setting is towards the maximum dial reading for 90 volts. Check for incoming voltage at L1 to L2 for at least 105 Volts AC Red power light is on.	This checks to see that voltage is getting to the control board.
	D--Bad traverse motor.	Remove the brushes one at a time and maintain orientation for reinsertion. See if brush is worn short 3/8" [9.5 mm] minimum length, and look at wear pattern on commuter for arcing. Replace brushes if necessary. Replace motor if brushes are good. Remove wires from A1 to A2 from the spin motor. Check with the ohm meter for "0" ohms across the white and black wires.	A short brush does not make an adequate electrical connection to run the electrical motor. NOTE: Brushes are long lived and seldom need replacing.

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Traverse speed control goes at one speed only.	**A--**Wiring hookup to potentiometer is improper. (If components have been replaced.)	Check potentiometer wiring for proper hookup. See that speed pot is wired per electrical diagram.	Wrong wire hookup effects traverse control. Reversing red and orange wires to potentiometer the DC motor will run at zero speed but maximum will be too slow. Reversing red and white wires does not affect speed control.
	B--Defective speed control potentiometer.	Check Potentiometer on control panel.	Traverse Drive Control Pin #8 to 7 Pot Full CCW 0 VDC Pot Full CW 9.75 VDC Pin #8 to 9 Pot Full CCW 9.75 VDC Pot Full CW 0 VDC If Yes, pot is O.K. If No, go to step below
		Check Petentiometer for 10,000 ohms. Remove three wires from Traverse Drive Control red from term #8 white from term #7 black from term #9	Check for 10,000 ohms red to white wires Full CCW--10,000 ohms Full CW--0 ohms Red to black wires Full CCW--0 ohms Full CW--10,000 ohms If Yes, pot is O.K. If No, replace potentiometer Wiper inside of potentiometer controls speed. Wiper may be bad and not making contact.
	C--Main circuit board dial pot settings not correct. (If board has been replaced.)	Check all pot settings on circuit board as shown in wiring diagram. (See adjustment section Traverse Motor Control Board Settings.)	Minimum and maximum pot settings effect traverse speed.

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
--MECHANICAL--			
Carriage traversing (varies speed) while grinding.	**A--**Oil on carriage drive shaft.	Wipe oil completely from shaft. Spray down with WD-40 and wipe off.	Driving torque is lost because the oil is decreasing friction for driving linear actuator bearings.
	B--Lineal bearings in carriage do not rotate freely.	Replace the lineal bearings in the main carriage. (For more detail, see lineal bearing replacement in the adjustment section of the manual.)	Grinding grit over a period of time does get into the lineal bearings and cause excessive drive torque of carriage. Abrasive noise is detectable when excessive grit is in the lineal bearings.
Traverse speed is too slow.	**A--**Lineal bearings in the carriage are set too tight.	Readjust bearings for proper tension. (For more detail see lineal bearing replacement in the adjustment section of the manual.)	When bearing preload is too tight, it causes excessive loading to drive the carriage. When lineal actuator is disengaged, the proper traverse load 2 to 3 lb. Use a tension scale to check. (A general guide only.) NOTE: Check with linear actuator released.
	B--Actuator springs set too tight.	Check to see if actuator bearings have been over-loaded, causing the bearings to not rotate freely. (For more detail, see actuator setting in the adjustment section of the manual.)	When actuator spring tension is excessive bear-ings will not rotate freely causing carriage to not run freely.

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Actuator drive shaft whipping excessively at high traverse speed.	**A--**Bearing shaft support blocks are not perpendicular to carriage shaft.	Loosen the screws that retain the shaft support blocks on each end of the actuator shaft. Use a square to align bearing face 90 degrees to the front rail and holding the actuator shaft to the front rail to 3.375 dimension. (For more detail, see align front rail and drive shaft in the adjustment section in the manual.	Misalignment of shaft support blocks to carriage traverse rod causes a bow in the rod. This bow will cause an out of balance which in turn will cause it to whip at high traverse speeds.
	B--Drive shaft is bent.	Turn the actuator screw clockwise 1/4 to 1/2 turn to release actuator from the drive shaft. Slide the carriage to one end of the machine. Mount indicator in the middle of the two bearing support blocks. Check for a maximum of .015 indicator reading when you rotate the shaft. Replace shaft if required. NOTE: Item A above must be done proper to this step.	Excessive bend in the shaft will cause the shaft to whip at high traverse speeds.
	C--DC drive motor shaft not concentric to drive shaft.	Loosen two bolts holding the motor. Align the motor shaft concentric to the drive shaft. See if coupling spiral gaps are equally spaced when re-aligned. (For more detail, see Traverse Motor Coupling in the adjustment section.)	Side load at the shaft end will bend the shaft and cause it to whip at high speed traversing.

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Top face of bedknife is ground in a concave shape (low in the center)	**A--**Grinding wheel loading up with grinding grit.	Dress the wheel prescribed in the Operators Manual.	A loaded wheel creates undue pressure on the surface being ground. Both ends of bedknife move because of this pressure, allowing bedknife to rock on the middle support.
	B--Too heavy a grind on the final grinding pass.	Follow the procedures in the Operators Manual. On the final pass, crank down only about .001" [.025 mm]. Let the wheel spark out for 10-20 passes at about 5 ft/min, with no additional infeed.	For precise grinding, sparking-out process is critical. It eliminates excessive final-grinding pressure on centers and middle support, which helps maintain grinding straightness.
	C--Gib screws loose, or carriage infeed screw loose.	Tighten gib screws to prevent movement (See Page 23). Also check for any grinding grit buildup behind the gib. Eliminate backlash in horizontal handwheel (See Page 24).	A loose gib, backlash in infeed screw, or grit buildup, allows grinding head to move when grinding.
	D--Carriage has varying load in either direction, because of grit buildup inside linear bearings.	With linear actuator released from the carriage, check for a 5 lb [2.25 kg] maximum traversing load in both directions. If load varies, or carriage linear bearings are excessively noisy, replace bearings (See Page 19).	Uneven loading because of grit buildup in bearings can affect the straightness of grinding. When grit buildup is excessive, bearings may be noisy and must be replaced.
	E--Rails not straight.	Check straightness. If not straight, consult the factory through your distributor. (This is carefully checked at the factory, so it is unlikely to be the cause.)	Straightness of rails is critical for accuracy of grinding.

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Top face of bedknife is ground in a convex shape (high in the center)	**A--**Grinding wheel loading up with grinding grit.	Dress the wheel prescribed in the Operators Manual.	A loaded wheel creates undue pressure on the surface being ground. Both ends of bedknife move because of this pressure, allowing bedknife to rock on the middle support.
	B--Too heavy a grind on the final grinding pass.	Follow the procedures in the Operators Manual. On the final pass, crank down only about .001" [.025 mm]. Let the wheel spark out for 10-20 passes at about 5 ft/min, with no additional infeed.	For precise grinding, sparking-out process is critical. It eliminates excessive final-grinding pressure on centers and middle support, which helps maintain grinding straightness.
	C--Gib screws loose, or carriage infeed screw loose.	Tighten gib screws to prevent movement (See Page 23). Also check for any grinding grit buildup behind the gib. Eliminate backlash in horizontal handwheel (See Page 24).	A loose gib, backlash in infeed screw, or grit buildup, allows grinding head to move when grinding.
	D--Carriage has varying load in either direction, because of grit buildup inside linear bearings.	With linear actuator released from the carriage, check for a 5 lb [2.25 kg] maximum traversing load in both directions. If load varies, or carriage linear bearings are excessively noisy, replace bearings (See Page 19).	Uneven loading because of grit buildup in bearings can affect the straightness of grinding. When grit buildup is excessive, bearings may be noisy and must be replaced.
	E--Rails not straight.	Check straightness. If not straight, consult the factory through your distributor. (This is carefully checked at the factory, so it is unlikely to be the cause.)	

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
The top face of the bedknife is ground unevenly across the width.	**A--**Grinding wheel rim is not completely over the top face being ground.	The wheel rim must extend over the bedknife top face by 1/2" [13 mm] whenever possible. See Operators Manual. If not possible, dress the wheel more often.	When the rim doesn't extend over the top face, it wears unevenly and causes grooves across the bed-knife.
	B--Gib screws loose, or carriage infeed screw loose.	Tighten gib screws to prevent movement (see Page 23). Also check for any grinding grit buildup behind the gib. Eliminate backlash in horizontal handwheel (see Page 24).	A loose gib, backlash in infeed screw, or grit buildup, allows grinding head to move when grinding.
Too coarse a grind on bed-knife.	Grinding head is traversing too fast.	Slow down the traversing speed to 12 FT/MIN.	Traversing speed controls the grinding surface texture. A slower traverse produces grind marks closer together.
The amount of stock removed varies when traversing in opposite directions.	**A--**Gib screws loose, or carriage infeed screw loose.	Tighten gib screws to prevent movement (see Page 23). Also check for any grinding grit buildup behind the gib. Eliminate backlash in horizontal handwheel (see Page 24).	A loose gib, backlash in infeed screw, or grit buildup, allows grinding head to move when grinding.

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
The top face of the bedknife shows burn marks from being too hot.	**A--**Coolant not directed onto the bedknife and grinding wheel.	Direct coolant into the grinding wheel, at the point of the grind. See Operators Manual.	When the front face of the bedknife gets too hot, the steel loses its temper (softens).
	B--Too heavy stock removal during grinding.	Take off about .002 to .003" [.05 to .075mm] per pass during rough grind. See Operators Manual.	Too much stock removal in one pass creates too much heat and softens the steel.
	C--Grinding wheel is glazing.	Dress the wheel before the finish-grinding pass on each bedknife. See Operators Manual.	Wheel will glaze if not dressed often enough. Also, as a general rule, use a higher traverse speed for the heavy grind.
Grinding wheel is glazing too quickly.	**A--**Wheel needs dressing.	Dress the wheel before the finish-grinding pass on each bedknife. See Operators Manual.	Wheel will glaze if not dressed often enough. If grinding wheel is not extended 1/2" [12 mm] over bedknife, it will glaze more quickly because there is less dressing.
	B--Too light a cut when rough grinding.	Take off about .002 to .033" [.05 to .075 mm] per pass during rough grind. See Operators Manual.	Too light a grinding cut doesn't permit enough dressing action on the wheel, so it glazes.
	C--Grinding head is traversing too slow.	Set the traversing speed to 12 FT/MIN.	Too slow a traverse speed can cause excessive heat buildup in the grinding wheel, which glazes the wheel.
Grinding motor vibrates excessively.	Grinding wheel is out of balance.	Visually check the outside-diameter run out while slowly rotating the wheel. Also check the motor without a wheel installed. Replace the wheel if out-of -round.	A grinding wheel which isn't properly trued up on outside or inside diameters can vibrate excessively and transfer that vibration to the motor.

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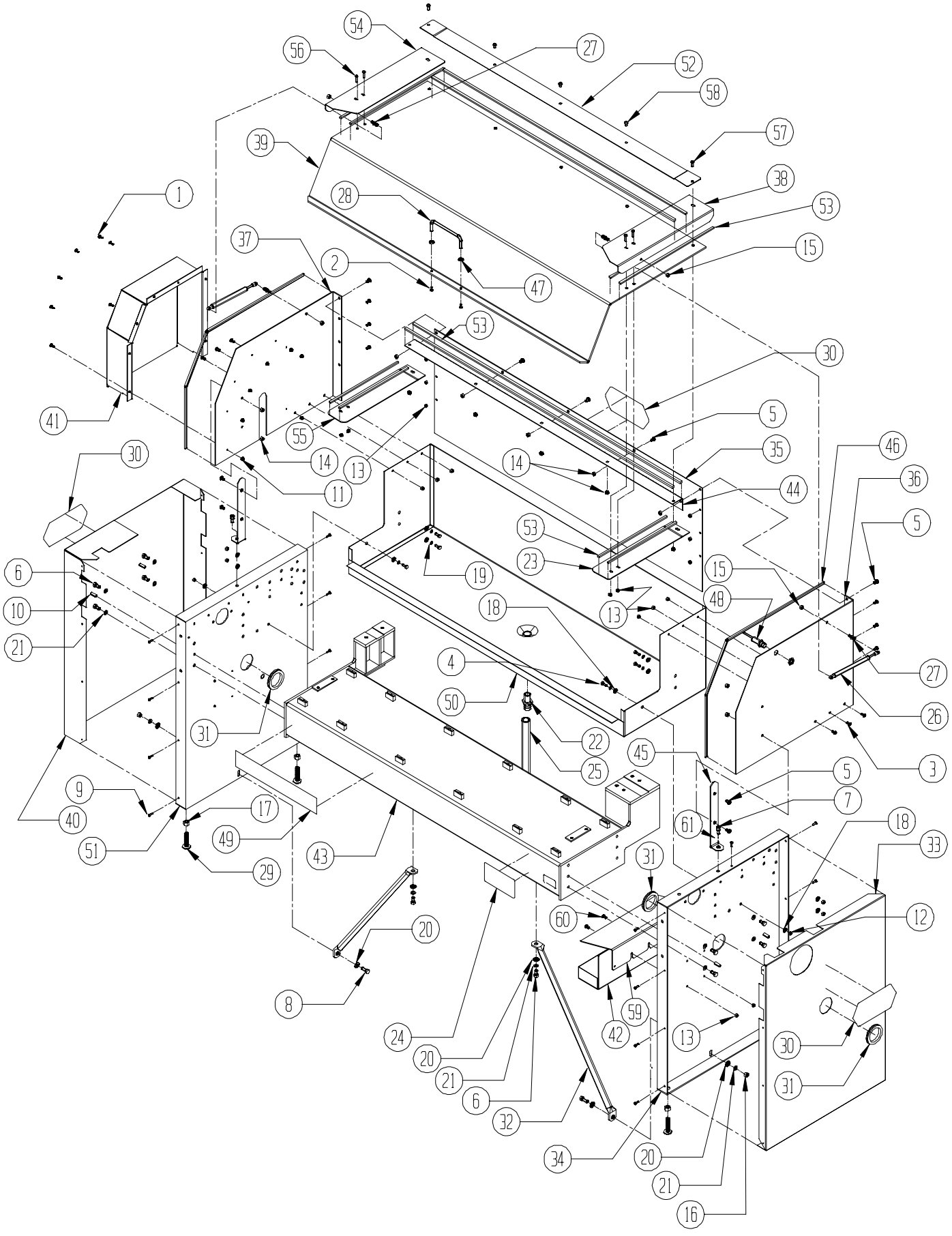
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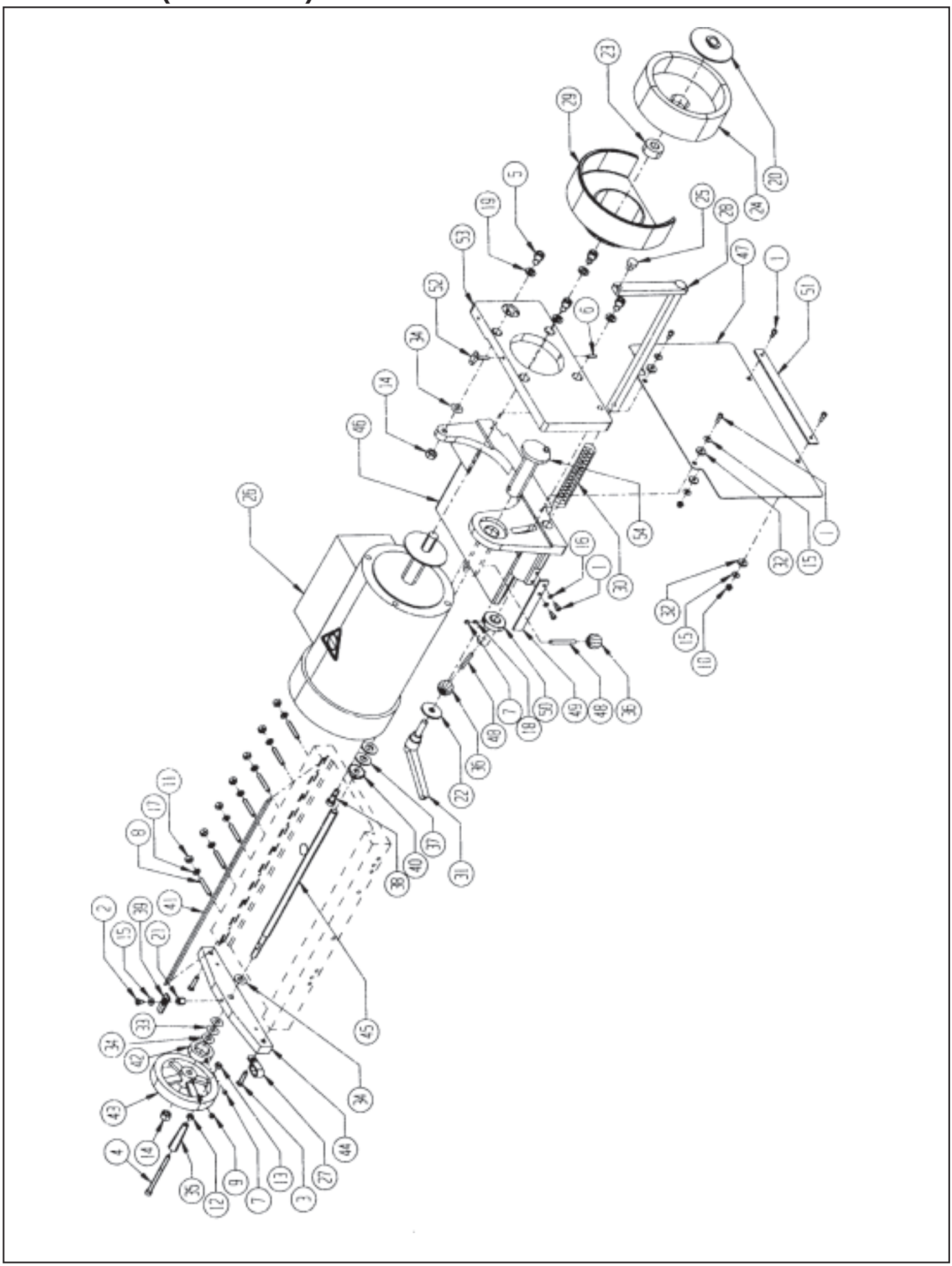
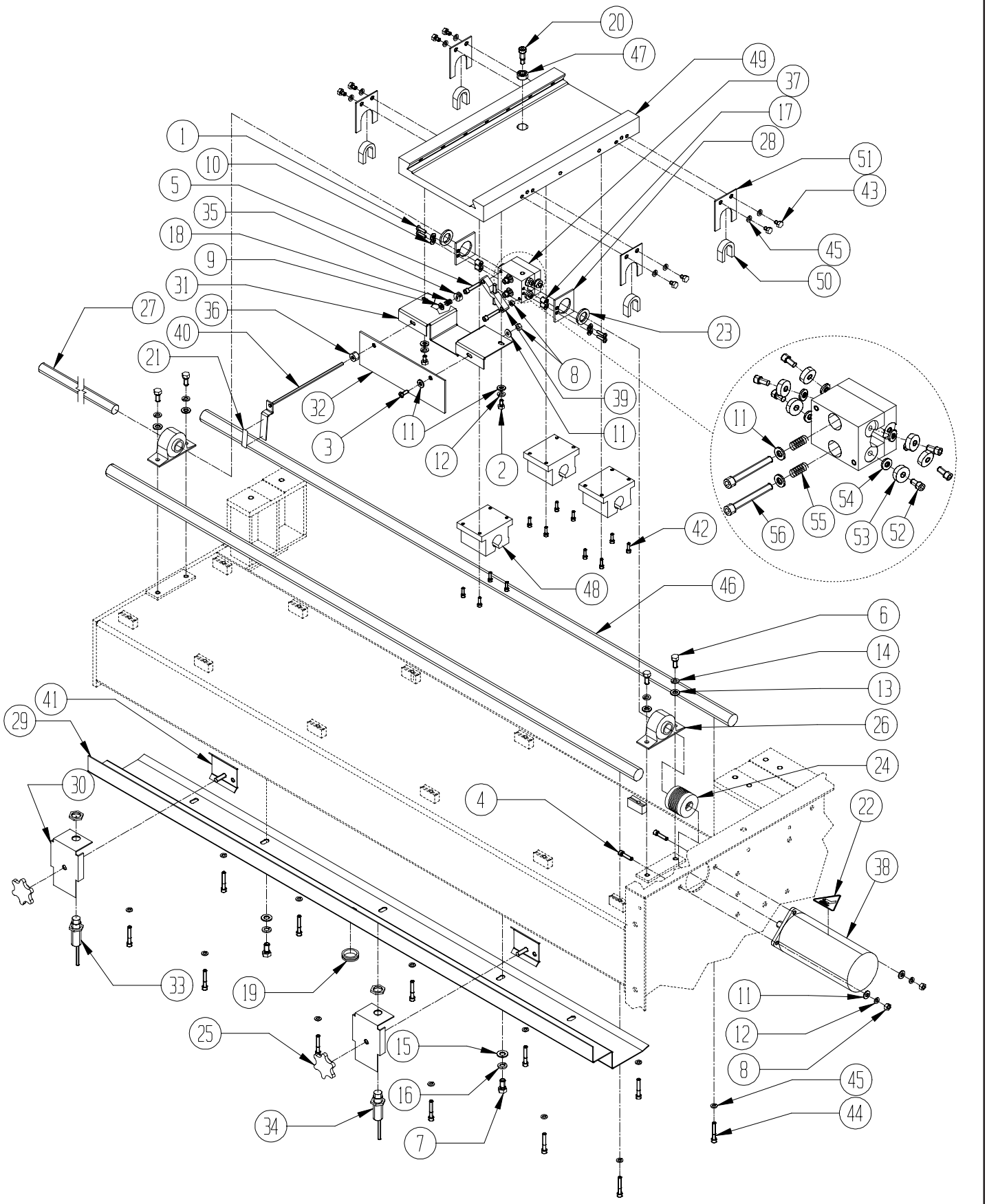
DIA. NO.	PART NO.	DESCRIPTION
1	B190613	Button Head Cap Screw 10-24 x 3/8
2	B190834	Button Head Cap Screw 10-32 x 1/2
3	B250816	Button Head Cap Screw 1/4-20 x 1/2
4	B251201	Hex Head Cap Screw 1/4-20 x 3/4
5	**3708693**	**Button Head Cap Screw 5/16-18 x 1/2**
6	B371201	Hex Head Cap Screw 3/8-16 x 3/4
7	B371211	Socket Head Cap Screw 3/8-16 x 3/4
8	B371601	Hex Head Cap Screw 3/8-16 x 1
9	D191067	Thread Cutting Screw AB #10
10	**H371602**	**Roll Pin .375D x 1.00LG**
11	J197000	Insert Locknut Jam 10-24
12	J251000	Hex Nut 1/4-20
13	J257000	Thin Locknut 1/4-20
14	J317000	Nylon Locknut Jam 5/16-18
15	**J317100**	**Nylon Locknut 5/16-18**
16	J371000	Hex Nut 3/8-16
17	J501000	Hex Nut 1/2-13
18	K250001	Flat Washer 1/4
19	K251501	Split Lockwasher 1/4
20	**K370001**	**Flat Washer 3/8**
21	K371501	Split Lockwasher 3/8
22	3708388	Male Barb Connector 1" 4509457
23	6709132	Plate-Door Spring R.H.
24	3708604	Warning Decal - Safety
25	**3849294**	**Return Hose, 1"**
26	3708569	Gas Spring #24
27	3708572	Stud Ball 10mm
28	3708577	D Handle
29	3709563	Adjustable Leveling Bolt
30	**3709990**	**Large Foley United Decal**
31	4509457	Grommet
32	6009008	Leg Brace
33	6009033	Right Hand Leg Frame Cover
34	6009510	Right Hand Leg Frame Weldment
35	**6709022**	**Back Upper Tank Panel**
36	6709026	Right Hand Upper Tank Panel
37	6709139	Left Hand Upper Tank Panel
38	6709130	Door Spring Bracket - R.H.
39	6709119	Tank Cover Door
40	**6709138**	**Left Hand Leg Cover**
41	6709137	Left Hand Upper Cover
42	6709124	UPS Bracket
43	6709048	Machined Traverse Base
44	6709117	Hinge Cover
45	**6709062**	**Upper Tank Side Bracket**
46	6709063	Rubber Trim 36"
47	6709071	Ferrule Handle
48	6709100	Guard Door Proximity Assembly
49	6709101	ACCU-Pro Decal
50	**6709505**	**Water Tank Base Weldment**
51	6709512	Left Hand Leg Frame Weldment
52	6709129	Door Plate
53	3708378	Foam Strip .25 Thick
54	6709131	Door Spring Bracket L.H.
55	**6709133**	Plate - Door Spring L.H.
56	B251616	Button Head Socket Screw 1/4-20 x 1
57	B311613	Button Head Socket Cap Screw 5/16-18 x 1.0
58	B311213	Button Head Socket Cap Screw 5/16-18 x 3/4
59	6709125	UPS Top Shield
60	B251016	Button Head Socket Cap Screw 1/4-20 5/8
61	R000454	Flat Washer .437 x 1.0 x .08T



DIA. NO.	PART NO.	DESCRIPTION
1	B190811	Socket Head Cap Screw 10-24 x 1/2
2	B191233	Phillip's Head Machine Screw 10-32 x 3/4
3	B251616	Button Head Cap Screw 1/4-20 x 1
4	B255011	Socket Head Cap Screw 1/4-20 x 3-1/8
5	B371211	Socket Head Cap Screw 3/8-16 x 3/4
6	**C190820**	**Set Screw 10-24 x 1/2**
7	C250420	Set Screw Cup Point 1/4-20 x 1/4
8	C252420	Set Screw Cup Point 1/4-20 x 1-1/2
9	C310420	Set Screw Cup Point 5/16-18 x 1/4
10	J197000	Locknut Insert Jam 10-24
11	**J251000**	**Hex Nut 1/4-20**
12	J252000	Jam Nut Hex 1/4-20
13	J257000	Locknut Thin 1/4-20
14	J377000	Locknut Jam Nylon 3/8-16
15	K190001	Flat Washer #10
16	**K191501**	**Lockwasher Split #10**
17	K251501	Lockwasher Split 1/4
18	3709705	Nylon Plug
19	K371501	Lockwasher Split 3/8
20	6709103	Outer Flange 3.0 OD 5/8-1
21	**3589081**	**Spacer .191ID x .4380D x .43L**
22	3589106	Flat Washer .39 x 1.38 x .125
23	3700409	Bushing-Reducer 1.25-.62"
24	3700411	Straight Grinding Wheel Cup 6 x 2 x 1.252
25	3702086	Diamond Dresser
26	**6709513**	**Motor - 1HP C-Face Mount**
27	3708121	Double Tube Clamp
28	6709509	Dresser Arm Weldment
29	6709552	Grinding Wheel Guard Weldment
30	3708553	Compression Spring .78ID x 7.0L
31	**3708561**	**Lock Handle**
32	3708691	Flat Washer
33	3709062	Conical Washer .382 x .75 x .035
34	3709204	Thrust Wahser .375 x .812
35	3709370	Handle
36	**3709526**	**Ball Knob 1/4-20**
37	3709620	Conical Washer .512 x 1.0 x .035
38	3709809	Shoulder Bolt .375D x .375L
39	3809047	Clear Indicator
40	6009024	Backlash Nut
41	**6009025**	**Gib Plate**
42	6009034	Calibrated Ring
43	6009044	Handwheel, 4.50 Diameter Model
44	6009136	Feed Screw Guide
45	6109013	Acme Adjusting Shaft
46	**6709000**	**Slide Carriage Base**
47	6709030	Rubber Cover
48	6709035	Handle Stud
49	6709037	Dresser Lock Bracket
50	6709038	Adjuster Collar
51	**6709039**	**Rubber Cover Bracket**
52	6709501	Tee Knob Assembly
53	6709502	Motor Pivot Assembly
54	6709503	Eccentric Pin Assembly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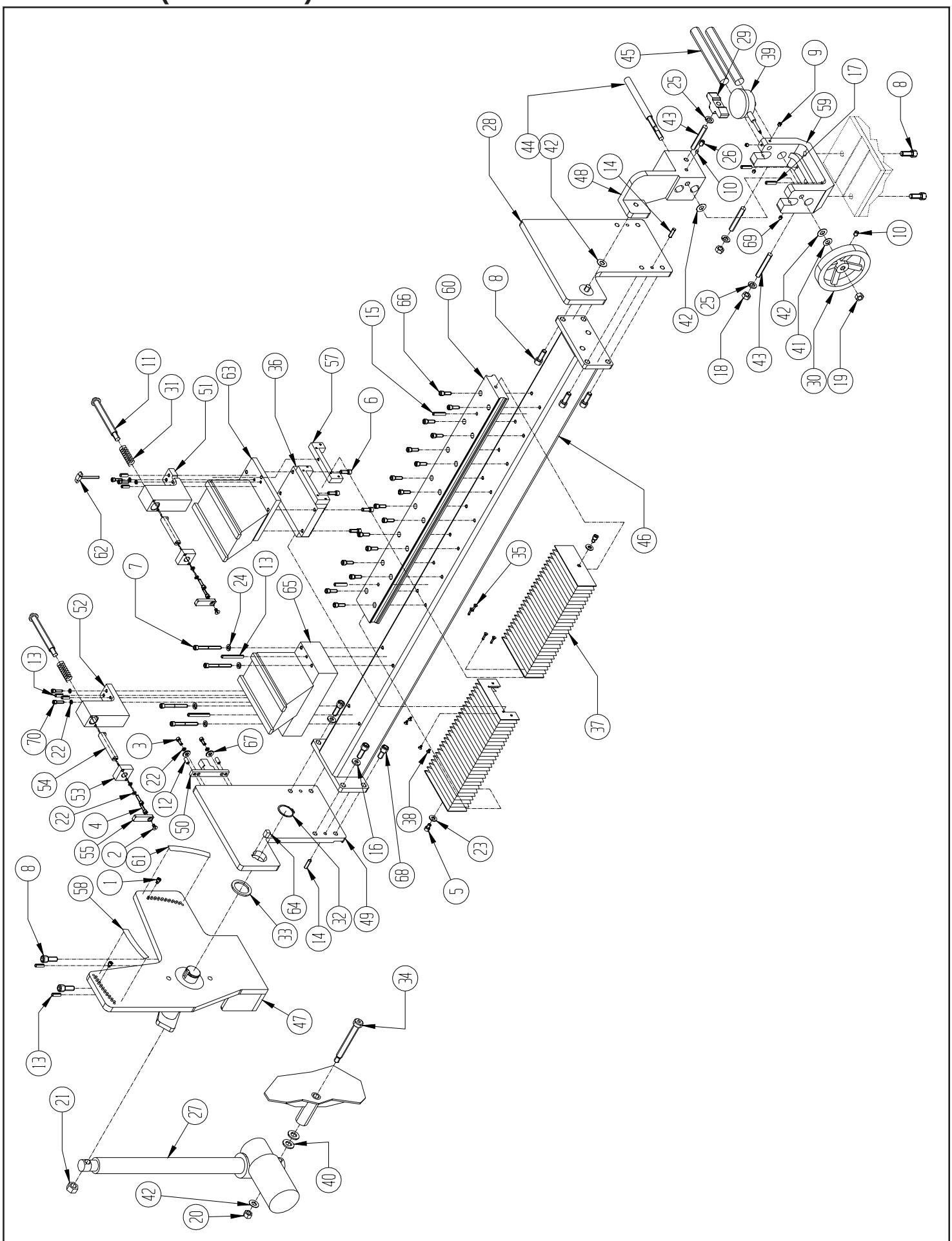
PARTS LIST (Continued) 6709520 TRAVERSE & CARRIAGE ASSEMBLY

DIA. NO.	PART NO.	DESCRIPTION
1	B191233	Phillip's Head Machine Screw 10-32 x 3/4
2	B250801	Hex Head Cap Screw 1/4-20 x 1/2
3	B251017	Round Head Machine Screw 1/4-20 x 5/8
4	B251611	Socket Head Cap Screw 1/4-20 x 1
5	**B251811**	**Socket Head Cap Screw 1/4-20 x 1-1/8**
6	B311201	Hex Head Cap Screw 5/16-18 x 3/4
7	B371201	Hex Head Cap Screw 3/8-16 x 3/4
8	J251000	Hex Nut 1/4-20
9	K190001	Flat Washer #10
10	**K191501**	**Split Lockwasher #10**
11	K250001	Flat Washer 1/4
12	K251501	Split Lockwasher 1/4
13	K310001	Flat Washer 5/16
14	K311501	Split Lockwasher 5/16
15	**K370001**	**Flat Washer 3/8**
16	K371501	Split Lockwasher 3/8
17	3589081	Spacer .191ID x .438OD x .43L
18	3619224	Compression Spring
19	3708046	Grommet
20	**3708147**	**Shoulder Bolt .375D x .625L**
21	3708454	Warning Decal - Release Actuator
22	3708457	Warning Decal - Hot Surface
23	3709183	Wiper Seal
24	3709583	Flexible Coupling
25	**3709613**	**Star Knob 5/16-18**
26	3709635	Pillow Block Brearing
27	3849239	Carriage Drive Shaft
28	3969032	Seal Mount
29	6009068	Proximity Support Rail
30	**6009070**	**Proximity Bracket**
31	6009071	Proximity Sensing Bracket
32	6009074	Rubber Pad
33	6009108	Left-hand Traverse Proximity Switch
34	6009109	Right-hand Traverse Proximity Switch
35	**6009152**	**Shaft Collar**
36	6009153	Rubber Washer
37	6009155	Modified Release Actuator
38	6009198	Traverse Motor Assembly
39	6009548	Actuator Bar Assembly
40	**6009549**	**Release Arm Weldment**
41	6009572	Proximity Rail Weldment Clamp
42	B191011	Socket Head Cap Screw 10-24 x 5/8
43	B250601	Hex Head Cap Screw 1/4-20 x 3/8
44	B252406	Socket Head Cap Screw 1/4-20 x 1 1/2
45	**K251501**	**Split Lockwasher 1/4**
46	3559117	Carrier Shaft
47	3709040	Spherical Bearing
48	3709044	Bushing Ball Bearing
49	3969004	Carriage Base
50	**3969063**	**Sponge Wiper Holder**
51	3969064	Sponge Wiper
52	3709668	Socket Head Screw
53	3709597	Sealed Bearing
54	3709596	Spacer
55	3709469	Compression Spring
56	B253211	Socket Head Cap Screw 1/4-20 x 2

PARTS LIST (Continued) 6709524 BEDKNIFE SUPPORT ASSEMBLY



DIA. NO.	PART NO.	DESCRIPTION
1	B190411	Socket Head Cap Screw 10-24 x 1/4
2	B190605	Flat Head Socket Cap Screw 10-24 x 3/8
3	B191011	Socket Head Cap Screw10-24 x 3/8
4	B191611	Socket Head Cap Screw 10-24 x 1"
5	**B250611**	**Socket Head Cap Screw 1/4-20 x 3/8**
6	B251211	Socket Head Cap Screw 1/4-20 x 3/4
7	B253611	Socket Head Cap Screw 1/4-20 x 2-1/4
8	B371611	Socket Head Cap Screw 3/8-16 x 1
9	C190420	Set Screw Cup Point 10-24 x 1/4
10	**C310420**	**Set Screw Cup Point 5/16-18 x 1/4**
11	6709518	Gage Spring Retainer Assembly
12	H250802	Roll Pin .25D x .50LG
13	H251202	Roll Pin .25D x .75LG
14	H251406	Drive Lock Pin .25D x .875LG
15	**H251802**	**Roll Pin .25D x 1.125LG**
16	K310101	Flat Washer 5/16
17	H251602	Roll Pin .25D x 1.00LG
18	J371000	Hex Nut 3/8-16
19	J377000	Nylon Locknut Jam 3/8-16
20	**J377100**	**Nylon Hex Locknut 3/8-16**
21	J507000	Nylon Locknut 1/2-13 thin
22	K191501	Split Lockwasher #10
23	K250001	Flat Washer 1/4
24	K251501	Split Lockwasher 1/4
25	**K371501**	**Split Lockwasher 3/8**
26	3579109	Nylon Plug 3/16 Diameter
27	6709127	Electromechanical Actuator
28	6709519	Pivot Bearing Assembly
29	3708245	T-Knob 2.5 3/8-16F
30	**3708393**	**Handwheel 3.5 Diameter**
31	3708554	Compression Spring .6250D x 3.0L
32	3708563	Retaining Extension Ring 5100-118
33	3708564	Oilite Thrust Bearing 1.25ID
34	3708330	Shoulder Bolt .50D x 4.0L
35	**3708702**	**Button Head Socket Cap Screw M3-.5 x 30**
36	3708694	Linear Bearing Wide
37	6709135	Rail Bellows 25/70
38	3708701	Button Head Socket Cap Screw M3-.5 x 16
39	3708581	Inch Dial Indicator
40	**3709016**	**Thrust Washer**
41	3709062	Conical Washer .382 x .75 x .035
42	3709304	Thrust Washer
43	6009035	Locking Stud Shaft
44	6009036	Acme Adjusting Shaft
45	**6009095**	**Slide Shaft**
46	6709004	Machined Tooling Bar
47	6709526	Tooling Mounting Bracket Assembly
48	6709107	Tooling Slide Mounting
49	6709008	Left-hand Pivot Plate
50	**6709011**	**Index Stop Bracket**
51	6709012	Right-Hand Gage Base
52	6709013	Left-Hand Gage Base
53	6709015	Retainer Block Gage
54	6709016	Gage Shaft
55	**6709021**	**Gage Tip**
57	6709134	Bearing Block Lock Block
58	6709058	Decal - Upper Tooling Index
59	6709108	Cross Slide Support
60	**6709136**	**Wide Machined Rail 25/70**
61	6709061	Decal - Lower Tooling Index
62	6709501	Tee Knob Assembly
63	6709506	Right-hand Magnet and Block Assembly
64	3708593	Key 5/16 SQ x 1/2
65	**6709510**	**Left-Hand Magnet and Block Assembly**
66	B251411	Socket Head Cap Screw 1/4 -20 x 7/8
67	3708691	Washer .25 x .62 OD x .12
68	B371211	Socket Head Cap Screw 3/8 - 16 x 3/4
69	C250627	Set Screw Cap Point 1/4 -20 x 3/8
70	**B191211**	**Socket Head Cap Screw 10-24 x 3/4**

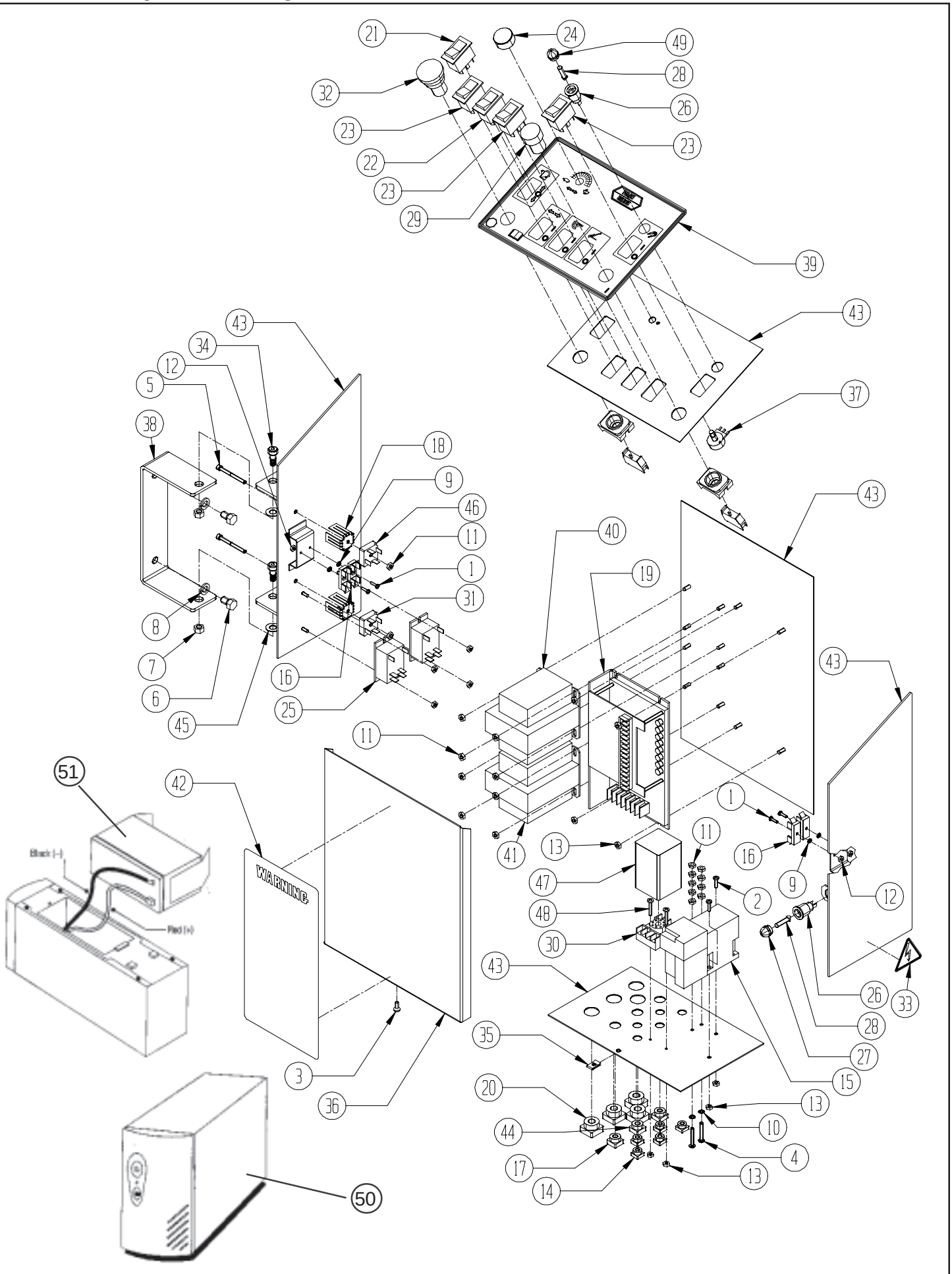

WARNING
Black (-)
Red (+)

DIAGRAM NO.	PART NO.	DESCRIPTION
1	B130812	Phillip's Head Machine Screw 6-32 x 1/2
2	B161014	Phillip's Head Machine Screw 8-32 x 5/8
3	B190809	Round Head Machine Screw 10-24 x 1/2
4	B192013	Button Head Cap Screw 10-24 x 1.25
5	**B192811**	**Socket Head Cap Screw 10-24 x 2.00**
6	B371001	Hex Head Cap Screw 3/8-16 x 5/8
7	J317100	Nylon Locknut 5/16-18
8	K371501	Split Lockwasher 3/8
9	R000480	External Teeth Lock Washer #8
10	**R000483**	**Internal Teeth Lock Washer #10**
11	R000553	Kep Nut 10-24
12	R000557	Kep Nut 6-32
13	R000558	Kep Nut 8-32
14	3707066	Strain Relief Wire .22/.23
15	**3707087**	**Magnetic Starter 1HP**
16	3707091	Fuse Block
17	3707279	Strain Relief Wire .30
18	3707370	Diode Heat Sink Bridge
19	3707400	Traverse Control Board
20	**3707416**	**Strain Relief Wire .33/.36**
21	3707428	On/Off Switch-Momentary
22	3707429	On/Off Switch
23	3707367	On/Off Switch
24	3707446	Pot Knob with Pointer
25	**3707447**	**120V Coil**
26	3707487	Pilot Lamp Socket
27	3707488	Amber Fluted Dome Lens
28	3707489	Lamp 24V .073AMP
29	3707509	Start Pushbutton Assembly
30	**3707073**	**8 Pin Socket**
31	3707515	Diode Bridge - 10 AMP
32	3707523	Stop Pushbutton Assembly
33	3708448	Warning Decal - Electrical
34	3709809	Shoulder Bolt .375D x .375L
35	**3709864**	**Tinnerman Nut**
36	6009062	Electrical Box Cover
37	6009199	Traverse Pot Assembly
38	6709068	Painted Pivot Bracket Box
39	6709070	Control Panel Decal
40	**6709072**	**Actuator Transformer Assembly**
41	6709073	Magnetic Transformer Assembly
42	6709091	Warning Decal
43	6709507	Control Box Weldment
44	3707273	Strain Relief
45	**3709304**	**Thrust Washer**
46	3707526	Bridge Diode - 25 AMP
47	3707074	Voltage Sensor - 100VAC
48	B161614	Phillip's Head Machine Screw 8-32 x 1
49	3707539	Green Fluted Dome Lens
50	**6709128**	**Battery Assembly-UPS**
51	3707548	Battery-Replacement UPS 3115

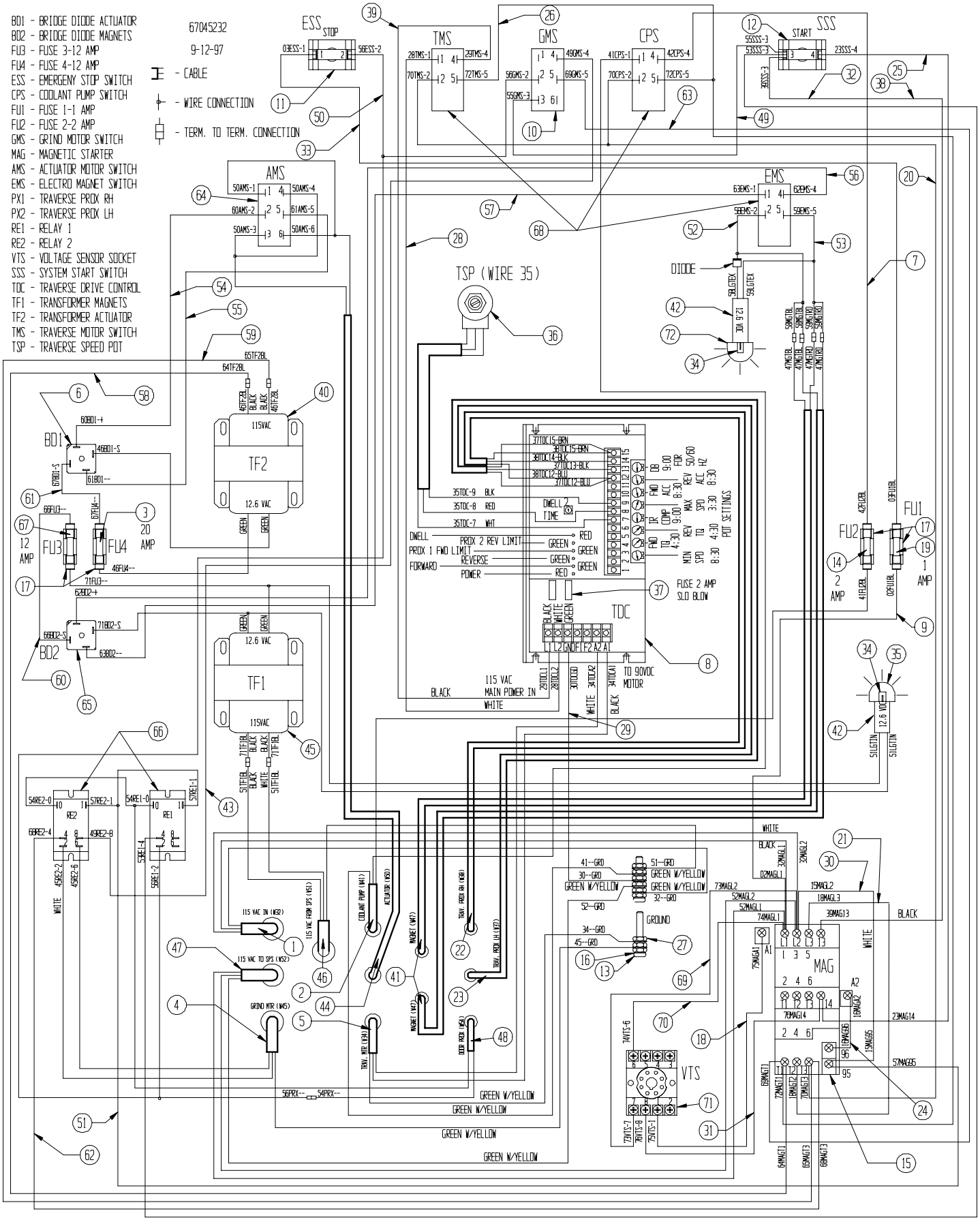
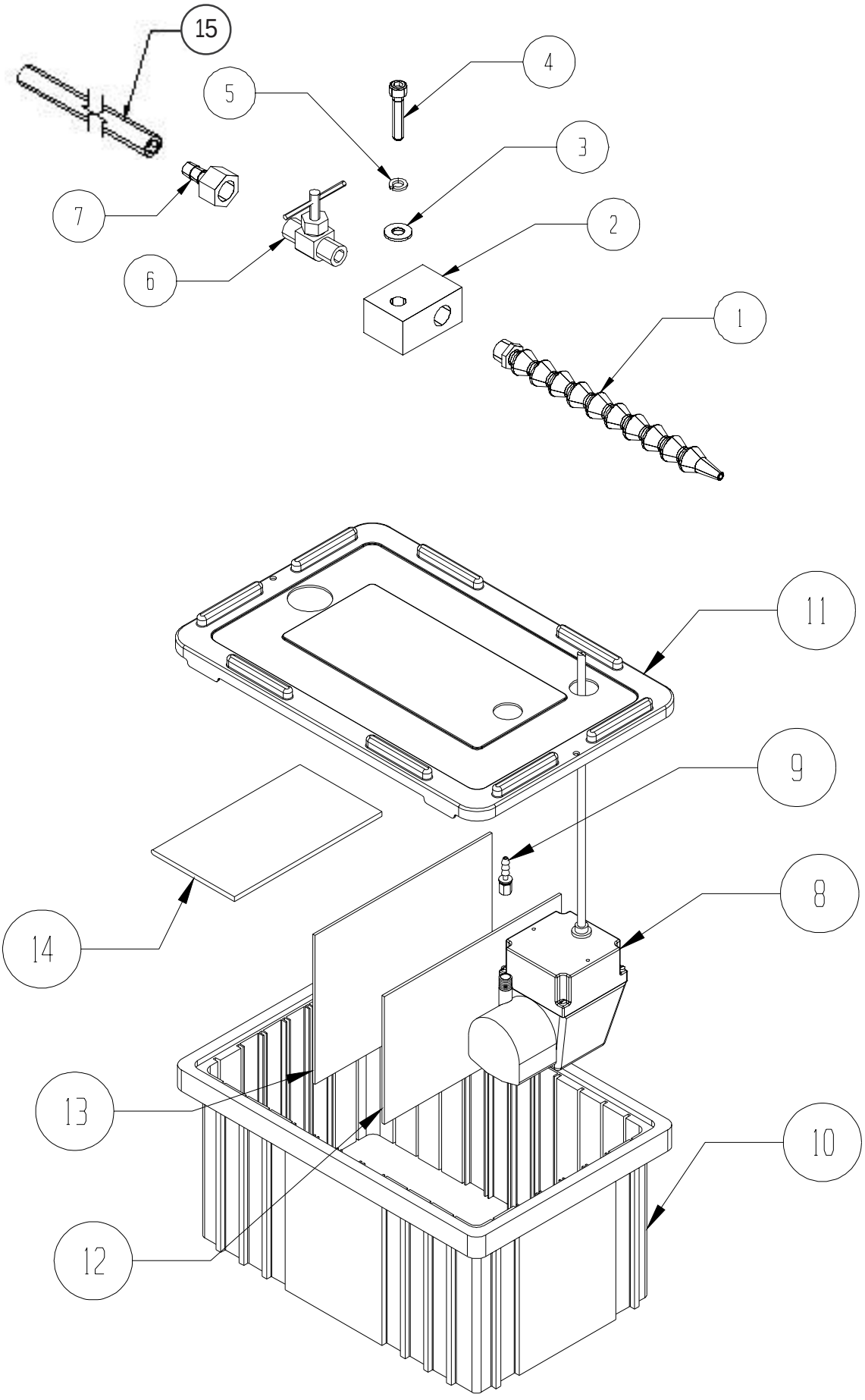

BD1 - BRIDGE DIODE ACTUATOR
BD2 - BRIDGE DIODE MAGNETS
FU3 - FUSE 3-12 AMP
FU4 - FUSE 4-12 AMP
ESS - EMERGENY STOP SWITCH
CPS - COOLANT PUMP SWITCH
FU1 - FUSE 1-1 AMP
FU2 - FUSE 2-2 AMP
GMS - GRIND MOTOR SWITCH
MAG - MAGNETIC STARTER
AMS - ACTUATOR MOTOR SWITCH
EMS - ELECTRO MAGNET SWITCH
PX1 - TRAVERSE PROX RH
PX2 - TRAVERSE PROX LH
RE1 - RELAY 1
RE2 - RELAY 2
VTS - VOLTAGE SENSOR SOCKET
SSS - SYSTEM START SWITCH
TDC - TRAVERSE DRIVE CONTROL
TF1 - TRANSFORMER MAGNETS
TF2 - TRANSFORMER ACTUATOR
TMS - TRAVERSE MOTOR SWITCH
TSP - TRAVERSE SPEED POT
67045232
9-12-97
- CABLE
- WIRE CONNECTION
- TERM. TO TERM. CONNECTION
ESS STOP
TMS
GMS
CPS
SSS
START
AMS
EMS
DIODE
TSP (WIRE 35)
TF2
TF1
BD1
BD2
FU3
FU4
FU1
FU2
TDC
VTS
MAG
RE1
RE2
115VAC
12.6 VAC
FUSE 2 AMP SLO BLOW
115 VAC MAIN POWER IN
TO 90VDC MOTOR
GROUND
GRIND MTR (WM5)
TRAV. MTR (YM1)
COOLANT PUMP (WM1)
ACTUATOR (YM3)
MAGNET (WM7)
MAGNET (WM2)
TRAV. PROX RH (WM8)
TRAV. PROX LH (WM9)
115 VAC IN (WM2)
115 VAC TO SPS (WM2)
115 VAC FROM SPS (YM5)
GREEN W/YELLOW
WHITE
BLACK

DIAGRAM NO.	PART NO.	DESCRIPTION
1	6009196	Cord Assembly Main Power W32
2	6109052	Receptacle Cor W41
3	3707525	Fuse 15AmP Slo-Blo
4	6709084	Cord Assembly -Grind Motor W45
5	**6009198**	**Traverse Motor Assembly W34**
6	3707526	Bridge Diode - 25 AMP's
7	6109053	Wire Assembly .25F/.25F W42
8	3707400	Traverse Control Board
9	6009180	Wire Assembly .25F/6FK W02
10	**3707429**	**Rocker Switch On/Off**
11	3707523	Stop Pushbutton
12	3709509	Start Pushbutton
13	B192013	Button Head Cap Screw 10-24 x 1.25
14	3707219	Fuse 2 AMP Slo-Blo
15	**3707087**	**Magnetic Starter 1 HP**
16	R000483	Internal Tooth Lock Washer
17	3707091	Fuse Block
18	6709112	Wire Assembly STR/FK W75
19	3707092	Fuse 1 AMP Slo-Blo
20	**6709087**	**Wire Assembly 2 Loop W70**
21	6009110	Wire Assembly 6FK/6FK W18
22	6009109	Right Hand Traverse Proximity Switch W38
23	6009108	Left Hand Traverse Proximitiy Switch W37
24	6009113	Wire Assembly 6FK/6FK W16
25	**6009202**	**Wire Assembly 6FK/6FK W23**
26	6709099	Wire Assembly 2 Loop W72
27	R000553	Kep Nut 10-24
28	6009117	Wire Assembly .25F/6FK W28
29	6009118	Wire Assembly 6FK/10RG W30
30	**6009204**	**Wire Assembly 6FK/6FK W15**
31	6709113	Wire Assembly STR/Fk W76
32	6709093	Wire Assembly .25 F/6FK W53
33	6009181	Wire Assembly .25F/6FK W03
34	3707489	Lamp 24V - 073 AMP
35	**3707488**	**Amber Fluted Lens**
36	6009199	Traverse Pot Assembly W35
37	3707219	Fuse 2 AMP Slo-Blo
38	6009201	Wire Assembly 6FK/6FK W39
39	6009104	Wire Assembly .25FK/6FK W29
40	**6709072**	**Actuator Transformer Assembly W46**
41	6709074	Magnet Assembly W47
42	3707487	Pilot Lamp Socket
43	6709077	Wire Assembly .25F/.25F W49
44	6709085	Actuator Cord Assembly Switch W50
45	**6709073**	**Magnetic Transformer Assemby W71**
46	6709086	Transformer Cord Assembly W51
47	6709076	Battery Assembly W52
48	6709100	Proximity Door Assembly W54
49	6709092	Wire Assembly .25F/6FK W55
50	**6709088**	**Wire Assembly 3 Loop W56**
51	6709098	Wire Assembly 2 Loop W57
52	6709090	Wire Assembly 3Loop W58
53	6709089	Wire Assembly 3 Loop W59
54	6709078	Wire Assembly .25F/.25F W60
55	**6709081**	**Wire Assembly .25F/.25F W61**
56	6709079	Wire Assembly .25F/.25F W62
57	6709080	Wire Assembly .25F/.25F W63
58	6709097	Wire Assembly .25F/6FK W64
59	6709096	Wire Assembly .25F/6FK W65
60	**6709082**	**Wire Assembly .25F/.25F W66**
61	6709083	Wire Assembly .25F/.25F W67
62	6709095	Wire Assembly .25F/6FK W68
63	6709094	Wire Assembly .25F.6FK W69
64	3707428	Rocker Switch Mom On/Off
65	**3707515**	**Bridge Diode - 10 AMPS**
66	3707447	Relay DPST 120V Coil
67	3707518	Fuse 12AMP Slo-Blo
68	3707367	On/Off Switch
69	6709110	Wire Assembly STR/FK W73
70	**6709111**	**Wire Assembly STR/FK W74**
71	3707073	8 Pin Socket
72	3707539	Green Fluted Lens


15
4
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12

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	3709642	Swivel Nozzle
2	3679116	Connector Shut - Off Valve
3	K190001	#10 Flat Washer
4	B191611	10-24 x 1 Socket Head Cap Screw
5	K191501	#10 Lockwasher Split
6	3709595	Shut Off Valve
7	3709593	Barbed Connector
8	3707532	Pump 115V
9	3708339	Connector - Barbed Insert
10	3708725	Tank - Coolant
11	3708774	Cover - Coolant Tank
12	3708775	Divider - Coolant Tank 5”
13	3708778	Divider - Coolant Tank 6.5”
14	3708785	Instruction Sheet - Coolant Tank
15	3389039	Coolant Hose